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ABSTRACT

The report is a composite of competency interviews and a compilation, evaluation, and analysis of data on agricultural products occupations (bakery, dairy, meat, and flour milling industry job titles). The study was conducted to obtain information which would identify the knowledge, skills, and attitudes needed by employees in selected job titles in the aforementioned industries in Montana. This was done through the use of competency statements, a competency instrument, and rating sheets used by trained interviewers. Responses were obtained from employees or supervisors, coded, and mean ratings were determined and ranked. The probability values were also ranked. The results of the rankings of personal qualities competencies, supervisor competencies, and the selected job title competencies are presented in table form. It was concluded that the research model satisfactorily yielded the data necessary for the purpose of the study. It was also concluded that, although the competencies for the job titles were defined broadly, the competencies rated were important to the particular job titles studied. The need for various competencies varied across the four industries--some were common to all, others were more specific. (The questionnaire, competency instrument, and pertinent forms and correspondence are appended.) (AG)

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A study to determine

Competencies Needed in Selected Job Titles in Agricultural Products Occupations

PUBLISHED BY DOLORES COLBURG,
SUPERINTENDENT OF PUBLIC INSTRUCTION

in cooperation with

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AGRICULTURAL AND INDUSTRIAL EDUCATION
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A STUDY TO DETERMINE COMPETENCIES NEEDED IN SELECTED JOB TITLES IN AGRICULTURAL PRODUCTS OCCUPATIONS

by

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The work presented herein was performed by the Montana Agricultural Experiment Station and Supported by the Office of the Superintendent of Public Instruction, Vocational and Occupational Skills Component

The Montana State University
Department of Agricultural and Industrial Education
Room 313, Linfield Hall, Bozeman, Montana
June, 1974

PREFACE

In the spring of 1970, a state-wide study to determine the nature and extent of rural youth and adult education and employment opportunities in agri-business and agriculture production was undertaken by the Department of Agricultural and Industrial Education.

Two of the five phases of the study have been completed. The results of these studies appear in the following eight reports available from the Office of the Superintendent of Public Instruction, Helena, Montana, 59601 and on microfiche in the library reference source, Educational Resource Information Center (ERIC):

PHASE I - 1970-1971 (To assess current and projected manpower needs in agri-business and agricultural production).

(ED 069 874) - Ag-Business Manpower Project Manual
(ED 069 872) - Ag-Business Manpower Project Report
(ED 069 875) - Agricultural Producer's Manpower Report Manual
(ED 069 873) - Agricultural Production Manpower Report

PHASE II - 1972-1973 (To determine the knowledge, skills and attitudes needed by potential employees in order to qualify for available jobs in agriculture.)

- A Study to Determine Competencies Needed by Employees Entering the Grain, Seed and Feed Business (CE 000 838)*
- A Study to Determine Competencies Needed by Employees Entering Agricultural Mechanics Occupations.
- A Study to Determine Competencies Needed by Employees Entering Sales and Services Occupations (CE 000 837)*
- A Study to Determine Competencies Needed by Employees Entering Agricultural Production Occupations.

In the spring of 1973, an agreement to extend Phase II an additional year was reached between the Department of Agricultural and Industrial

*ED numbers assigned in the June 1974 ERIC Reference Index.

Education and the project supervisors from the Research, Planning, Development and Evaluation Component of the Office of the State Superintendent. During the extension of Phase II, competencies needed in selected job titles in the agricultural products industries in Montana were studied.

This report is a composite of competency interviews and a compilation, evaluation and analysis of the data in the products area. A section on research methodology is also included. This report is in keeping with the major objective of the overall study - to provide essential information for curriculum development and ultimately to agricultural education programs in order to meet manpower demands for agricultural production and agri-business in Montana.

ACKNOWLEDGEMENTS

Cooperation and assistance from personnel representing many agencies and businesses facilitated the research. Those who assisted in the validation of the competencies were Mr. Bernard Lea of the Peavey Company; Mr. E. E. Riedelbach of R and R meats; Mr. Hank Vollmer of Vollmer and Sons; Mr. Ed McHugh of Clover Leaf Dairy; Mr. Ralph Schillinger of Darigold Creamery; Mr. C. E. Petaja of Sweet Grass Creamery; Mr. Joe Gipe at Eddy's Bakeries; Mr. Emery Pettys of Sweetheart Bakeries and Mr. Carlo Ciri at C & P Packing Company. We are also indebted to those persons in Midland and Pierce Packing Companies who assisted.

Additional thanks go to Mr. Clayton Wilson, Mr. Frank Youngheim, and Mr. Doug Smith of Sweetheart Bakeries and Mr. W. S. Gray and Mr. Jim Wills of Eddy's Bakeries.

Montana State University's Departments of Agriculture, Animal and Range Science, Library, and Mathematics also contributed their support to the project. Dr. Ken Tiahrt is extended special acknowledgement.

Appreciation is also expressed to the businesses and their employees who responded generously to the requests for information and to the six persons who served in the role of interviewers.

Mrs. Carolyn Manley, Secretary of the Agricultural Manpower Project ably completed the execution of this manuscript.

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ERATA SHEET

A STUDY TO DETERMINE COMPETENCIES NEEDED IN SELECTED JOB TITLES IN AGRICULTURAL PRODUCTS OCCUPATIONS

Page 2 - work. Specifically with to work because of

Page 3 - Director of Montana Manufacturers to Directory of Montana Manufacturers

Page 7 - Occpations to Occupations

Page 36 - Pub to Put

Page 42 - andSupervising to and Supervising

Page 45 - rank to rack

Page 51 - doug to dough

Page 57 - were" to were

Page 123 - hiringhighly to hiring highly
this industry to this industry

Page 146 - page 10 to (Page 10)

Page 146 - nine competencies to ten
three were to two were

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Montana State University
Bozeman, Montana

CHAPTER I

INTRODUCTION

The nature of the food problem per se has changed over several years. In the past, surplus goods, storage problems and land deferments were the concerns of the agricultural industry. The nation's attention is presently focused on the rapid increase in food prices and on the scarcity of certain commodities.

The production, processing and distribution of food is the nation's largest business.[14] One out of every five workers in the United States is found on the farm or in processing, transportation, retailing or restaurant food service. Farming itself employs 4.3 million workers including both family and hired workers,[3] which is as many as the combined employment of the transportation, steel and automobile industries.

Eight to ten million people are employed in all aspects of the food marketing chain. This figure includes those in canneries, meat packing plants and food packaging. The total payroll in marketing is 38 billion dollars per year.

The USDA Office of Communication has stated that meat and poultry workers total 310,000 and receive a payroll of 2 billion dollars. There are 212,800 dairy processing-products workers receiving a payroll of 1.4 billion dollars.[14] Employment in the processing of fruits and vegetables accounts for 233,100 workers and has a payroll of 1.5 billion dollars. Other employees are involved in transporting farm commodities and in the distributive aspects of marketing agricultural products.

Locally, the economic focus is also upon agriculture. Agriculture is the undisputed financial king of all Montana enterprises. It rings the loudest cash register in the state. A comparison of agriculture with other industries in Montana (1972) revealed the following hierarchy:

1st - Agriculture - $794.6 million annual income
2nd - Wholesale - $300 million retail trade
3rd - Mining - $285 million (3 times behind agriculture)
4th - Tourism - $210 million
5th - Oil - $103.9 million (7 times behind agriculture)
6th - Lumber - $82 million (almost 10 times behind agriculture)[19]

In 1972, wages for persons employed in Montana in the four industries surveyed in this research effort were $7,977,050 in Meat Packing and Slaughtering; $5,710,223 in Dairy Processing; $5,348,856 in Flour Milling and $4,576,414 in the Bakery Industry.[18]

Traditionally, the objective of vocational education has been to prepare people for potential employment. As agricultural trends change, the nation must keep pace with the demand for skilled employees. The need to provide realistic, job-oriented programs in all aspects of agriculturally related industries provides an important challenge for agricultural educators.

Montana has a unique problem in preparing employees to enter the world of work. Specifically with its sparse population, and limited industrial facilities. The emerging vocational offerings must be assessed, evaluated and coordinated to prepare people to enter the world of work. It is assumed that persons who have appropriate education will have an advantage for entry and advancement over persons employed who do not possess training in agriculture and its related industrial opportunities.

RATIONALE FOR THE STUDY

The objective of this phase of the study was to obtain information which would identify the knowledge, skills and attitudes needed by employees in selected job titles in the bakery, dairy, meat and flour milling industries in Montana. These industries and the job titles were chosen after a survey of representative industries listed in the Director of Montana Manufacturers under the Standard Industrial Classifications (SIC). They were selected because of the number of persons they currently employed in agricultural products. Employees in the grain, seed and feed business in Montana were omitted from this study since this industry was earlier researched and reported. See note in Preface.

This study is being conducted by the Department of Agricultural and Industrial Education as part of an overall research effort to obtain a comprehensive analysis of agricultural occupations in Montana and of the competencies needed to enter, perform and advance in agricultural and agriculturally related jobs.

One of the major goals of the Department of Agricultural and Industrial Education of Montana State University is to construct and test research models which hopefully will provide improved employment for citizens in Montana. Thus, a specific extension of the study objective will be the documentation of a survey research model.

ASSUMPTIONS

The following assumptions were generally accepted by the researcher at the beginning of the study: (1) that management from agricultural products businesses would be interested in the potential outcome of the study and would cooperate with the interviewers by providing information on the tasks of selected employees and would make their personnel available for interviews; (2) that persons being interviewed would rate previously validated competency statements on a graduated scale (1-4); (3) that ratings would lend themselves to statistical analysis, so that the competency statements could be listed in order of importance; (4) that there is no significant difference between job competency ratings given by the person actually performing the job and the ratings of another person (supervisor or manager) knowledgeable about the job; and (5) that an analysis would be possible to determine if there were commonalities among job tasks across industry lines.

DEFINITION OF TERMS

Agricultural Occupation - means an occupation involving knowledge and skills in agricultural subjects and having the following characteristics:

a. The occupation includes the functions of producing, processing and distributing agricultural products and includes services thereto;

b. The occupation requires competencies in one or more of the primary areas of plant, soil and animal science, farm management, agricultural mechanization and agricultural leadership.

Agricultural Products Business - are those businesses which assemble, sort, test, grade and market farm and ranch products. For purposes of this study, they involve the job titles in the meat, dairy, bakery and flour milling businesses.

Competency - Competencies for purposes of this study are those qualities of knowledge, skill and attitude determined to be desirable by employees for them to perform effectively in an identified job title at the entry level.

Competencies Needed for Entry Employment - are those competencies without which the individual will not be hired.

Entry Level Employment - is the level at which individuals are normally hired in any particular job title by an industry.

REVIEW OF RELATED LITERATURE AND RESEARCH

Since an extensive review of literature preceded the previously completed agricultural manpower studies and since this research effort was an extension of the project, only pertinent information on agricultural products will be reviewed and reported.

Review of Research and Literature Related to the Feasibility, Need and Importance of the Study

Hensel (1969) states that there is a need for definite information on the occupations for which a student is being trained. He suggests that there is a need to insure that instructional programs in agricultural education are sound and of high quality. He continues by stating that the character of the agricultural industry has changed from an agrarian complex to an agrarian-industrial complex which requires new patterns of education and training.[8]

Sherman and Pratt (1971) stated that processing and distribution of the food and fiber produced on farms is of prime importance to the economy as well as to the consumer. Three-fifths of all farm products require some degree of processing prior to use. Because of consumer demands for quality in food products, various government agencies and industries have set rigid standards in many areas of processing, packaging, shipping, storage and sales. They infer that the processing of agricultural products requires skilled technicians and skilled workers to operate and maintain the special machines and equipment used in these operations.[12]

Research efforts by Taylor and Leagans (1970) established the fact that

processing is a major division of agri-business and the fact that present trends suggest it will become more important.

Review of Literature Related to Similar Efforts In Agricultural Products

A search for similar studies dealing with job titles or clusters of occupations in agricultural products was enhanced by a study by the University of Missouri (1969) in which dairy processing equipment operators and meat processing workers were surveyed. A listing of job titles in dairy products, meat, poultry and egg processing with accompanying Dictionary Occupational Titles (DOT) references was also a part of this study.[11]

Job titles in agricultural processing and clustering of occupations was found in the Arizona study (1971). Some of the competencies required by these job titles are found in Table 3 of this report and the number of employees needing these competencies is a part of the results of this investigation. The instruments used in these studies were also carefully reviewed to obtain ideas for format.[15] The Taylor and Leagens Study (1970) mentioned previously had an extensive instrument with directions for the interviewer incorporated into the questionnaire.[16]

Barwick (1965) identified present and emerging agricultural occupations other than farming for which agricultural education is needed. This study contains an analysis of employees needing agricultural competencies in identified agricultural occupational families. Occpations within families were classified as supervisory, technical, clerical, skilled and semi-skilled.[6]

Procedures compiled by Pennsylvania State University (1973) and recommended for identifying competencies for natural resources occupations were adapted

and followed as a model for use in the present study. These procedures were distributed at the meeting of The American Vocational Association, attended by the researcher.[17]

Review of Research and Literature Related to the Job Clustering Approach and Criteria for Clustering

Sjogren and Sahl (1966) defended the job clustering approach by stating that vocational curricula should not be specific to a single job but should be designed to prepare the student to enter any one of a number of jobs in the job cluster.[13]

Research by Walter Mietus (1969) set the following criteria as a basis for selection of the clusters and special occupations for each category:

The occupation must have:

1. A favorable employment outlook.
2. The instructional capability of being implemented in a secondary school program.
3. Opportunity for job entry upon graduation from high school.
4. Numerous skills, knowledge and human requirements which would provide an opportunity for the identification of commonalities or relatedness with other occupations.
5. Opportunities for advancement for further schooling as on the job training or apprentice programs.[10]

Mietus (1969) also established the criteria of occupational clusters.

Occupational clusters should:

1. Be in the area of vocational and industrial education.
2. Include occupations that are related on the basis of either similar process, materials, products or human requirements.
3. Be broad enough to include occupations with a wide variety of skills and knowledge.

4. Involve occupations that require not more than a high school education and/or 2 years beyond high school.

5. Provide opportunity for mobility on a geographical and occupational basis.[10]

The Mietus statements provided guidelines upon which to base the cluster concept, repeatedly referred to in the literature.

Review of Literature and Research Relating to Alternative Statistical Measures

A perusal of the literature was made to determine possible alternative statistical measures other than those used in the former research of this nature. Loreen (1967) used an index computed by the following formula:

$$\text{Index \#} = \frac{\text{Number of desirable responses} + 2(\text{no. of essential responses})}{\text{Maximum possible desirable responses} + 2(\text{essential responses})} \times 100$$

Competencies receiving a score of 39 or more were ranked in descending order.[9]

Many of the studies reviewed used the statistical measure of factor analysis as a means of clustering competencies or arriving at occupational families.[16] An example of the successful use of factor analysis is reported in a study by Dillon and Cain (1963).[7]

Consideration was also given to the statistical measures used in previous research efforts of the Agricultural Manpower Project.[5] Weighted scores and standard deviations were employed in the production, mechanics and grain, seed and feed studies. After an assessment of these procedures and their inherent weaknesses, the research team decided to evaluate and report data on the basis of the mean ratings provided by those interviewed.

METHODOLOGY

Locating job titles among Montana's agricultural industries and determining the competencies which employees considered important in performing in these positions took the following form:

1. Selection of a representative sample of Montana agricultural products industries representing several commodities; surveying these industries to determine the job titles and numbers within these job titles; identification of the job titles across industry lines.

2. Development of competency statements, the instrument and rating sheets.

3. Training interviewers and distribution of interviewing materials.

4. Devising a coding rationale; initiating computer analysis; interpretation of results.

Selection of a Representative Sample

The population was considered to be contained within the publication; Directory of Montana Manufacturers. This directory listed 150 businesses engaged in the processing of food and kindred products. All of these businesses were surveyed by questionnaire (Appendix A) for the purposes of identifying job titles and the number of persons working in each job title. Two mailings, an initial and a follow-up, resulted in a return of 81 or 54 percent of the questionnaires being returned.

These returns were then tabulated on a two-way table with industries on one axis and job titles on the other. The number of persons in each job title was tabulated and the results were reviewed to determine in what job titles the largest numbers of personnel were employed.

The majority of the employees were within the meat, bakery, dairy and flour milling industries.

Field interviewers were hired to contact the 81 businesses in the study population. These 81 businesses were made up of 19 bakeries, 31 dairies, 28 meat packing and processing plants and 3 flour mills. Businesses were of varying sizes and located geographically throughout the state of Montana. Meat businesses were concentrated in the major centers of population (Butte, Bozeman, Helena, Missoula, Billings, Great Falls). (Figure 1.)

FIGURE 1

SAMPLE SELECTION RESPONSES CLASSIFIED BY INDUSTRY

INDUSTRY	NUMBER ASSIGNED	NUMBER COMPLETED	PERCENT RETURN
BAKERY	19	15	79%
DAIRY	31	25	81%
MEAT	28	25	89%
MILL	3	3	100%
TOTALS	81	68	84%

Development of Competency Statements, Instrument, and Rating Sheet

As was true in previous manpower studies, the compilation of competency statements and their validation for the several identified job titles proved to be a tedious task. The Dictionary of Occupational Titles (DOT)[4] served as the basis for developing competency statements. These preliminary statements were then taken to employees working in specific industries and job titles for review. Employees suggested the logical ordering of competencies, made deletions and additions and changed or up-dated vocabulary common to their positions. After revisions were made according to their suggestions, the competencies were again reviewed by them for final approval. A special effort was made to validate the competencies with employees of various-sized businesses. An array of job titles and the industries in which they are present appears in Figure 2. Job titles appearing in two or more industries used the same instrument. (ie. Shipping Clerks in the bakery or meat industry reacted to the same competencies.)

Each competency statement was assigned a number. The statements were then typed in the final format (Appendix B) and collated into a tabbed, color-coded book. A rating sheet (Appendix C) was also used on which the interviewer circled an appropriate value and the number of the competency being rated.

FIGURE 2

AN ARRAY OF JOB TITLES AND THE INDUSTRIES
IN WHICH THEY ARE PRESENT

JOB TITLE	BAKERY	DAIRY	MEAT	MILL
Supervisor	X	X	X	X
Plant Worker, etc.	X	X	X	X
Salesman	X	X		
Warehouseman, etc.	X	X		X
Shipping Clerk			X	
Mixer	X			
Divider Operator	X			
Molder Operator	X			
Bench Hand	X			
Baker Retail	X			
Ovenman	X			
Handbagger	X			
Buttermaker		X		
Cheesemaker		X		
Lab Technician		X		
Pasteurizer		X		
Ice Cream Maker		X		
Butcher			X	
Meat Cutter			X	
Sausage Maker			X	
Render Operator			X	
Crop Production Competencies				X
Chemist				X
Miller, etc.				X
Buhr-Miller				X
Smutter				X

Interviewer Training and Distribution of Materials

Six interviewers were employed; each had previously received training and worked on one of the previously completed Agricultural Manpower studies. It was not necessary to retrain them since the instruments and system used were identical to those used before. Interviewers' manuals were revised and additional instruction sheets (Appendix D) prepared. Materials were mailed to them and they were instructed to call the researcher for additional supplies and for assistance.

A letter (Appendix E) was sent to the selected respondents announcing that an interviewer would be contacting them for information.

Coding, Computer Analysis and Interpretation of Results

A coding rationale (Appendix F) was designed to yield the variables (competency statements) and the mean and frequency. This was accomplished by preparing cards for the variables and an additional deck of cards containing the data. The program used was the Statistical Package for the Social Sciences.[1]

After the mean ratings for each competency were obtained, the researcher ranked them in order. This was initially done by key punching the variable number and the mean onto a computer card, sorting these in the sorter in descending order and running them through the computer to produce a card list.

To further analyze the data, Chi Square Work Sheets (Appendix G) were prepared and the frequencies were entered for like competencies across industry lines. This greatly facilitated the operation of the computer terminal to determine probability values.

Probability Values Ranked

The probability values related to the obtained chi squares were ranked by the researcher. This is a common procedure but one for which no published reference can be cited.

It was arbitrarily determined that the top 25 percent of the probability values for the competencies for a particular job title were "very similar", that the next group of competencies, below the top 25 percent but with a probability value above the .05 level were "similar", and that those competencies with probability values below .05 were "not similar." This is simply a guideline or another means of identifying competency differences that are "similar" or "not similar", and is in accordance with the usual .05 level test of significance. Competencies with probability values below .05 were then listed in tables displaying the frequencies which occured in each industry. A short narrative explaining where the difference occured in the rating is also included.

It will be noted that in the contingency tables several cells contain "0" and also contain numbers with values less than "5".

The researcher understands that to use the Chi Square test to determine differences where the above two conditions exist is in violation of the assumptions regarding the use of this test. However, appropriate tests could not be located to test data where cells contained "0". Combining cells did not appear to be an appropriate answer since "0" responses did not mean missing data but rather no data.

Thus the application of the Chi Square test to determine levels of significance simply seemed to verify what seemed evident visually from looking at the raw data.

CHAPTER II

ANALYSIS OF THE DATA

The data were analyzed to determine the importance of job competencies identified and validated by either an employee or his supervisor in Montana's agricultural products industries. Job titles within four broad industry groups were surveyed; bakeries, dairy, meat and the flour milling industries.

These tables show how competencies were ranked by employees or supervisors in the four industry groups by job title. Competencies were ranked using mean score ratings as a measure of relative importance of each competency. Subsequent tables show a rank order by probability values and evaluation.

Bakery Industry:

The bakery industry employs a considerable number of people in Montana. Sweetheart and Eddy's bakeries operate the largest plants employing persons in a wide range of job titles. The large food chains such as Buttrey's, Safeway and Albertson's also operate in-store bakeries and employ persons in the bakery job titles. Small retail bake shops usually operated by one or two employees or owners are also important in an assessment of the Montana bakery industry.

Table 1 shows the rank order of Personal Quality competencies as ranked by thirty employees in all job titles in the bakery industry. Tables 1 through 13 report competencies essential for persons in various job titles in the bakery industry.

Personal Qualities

Data in Table 2 indicates that the personal competencies showed a mean rating ranging from 3.7 to 3.2, indicating all twelve competencies were rated as being between "Important" and "Essential". Those personal qualities rating in the top 25 percent were: Demonstrate a willingness to work; Work safely and neatly; Get along with others and Demonstrate acceptable personal appearance and personal hygiene.

Personal competencies ranking in the bottom 25 percent were the ability on the part of the employee to: Demonstrate a desirable job attitude; Work as a team member; Project a desirable firm image and Accept routine tasks.

The difference in ratings regarding Personal Quality competencies as compared across all agricultural products industries studied will appear in Table 38.

TABLE 1

PERSONAL QUALITIES COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Bakery Industry N=30	Frequency 1	2	3	4	Mean Rating
1	1	Demonstrate a willingness to work.			10	20	3.667
2	6	Work safely and neatly.		1	8	21	3.667
3	5	Demonstrate the ability to get along with others.		1	11	18	3.567
4	9	Demonstrate acceptable personal appearance and personal hygiene.			13	17	3.567
5	12	Maintain a satisfactory attendance record.			13	17	3.567
6	2	Demonstrate a willingness to learn or take supervision.	1	1	10	18	3.500
7	3	Demonstrate the ability to follow directions of supervisor.	1		12	17	3.500
8	4	Demonstrate the ability to work independently.		1	13	16	3.500
9	8	Demonstrate a desirable job attitude about the organization when working with fellow employees, potential customers and customers.		1	15	14	3.433

TABLE 1 - Continued

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Bakery Industry N=30	Frequency 1	2	3	4	Mean Rating
10	7	Demonstrate the ability to work cooperatively as a member of a team.		1	16	13	3.400
11	10	Demonstrate the ability to project a desirable image for firm.		2	15	13	3.367
12	11	Accept routine tasks without becoming disinterested.	1	2	16	11	3.233

Supervisory Competencies

Data in Table 2 indicates the mean rank order ratings of the supervisory competencies ranked by supervisors in the bakery industry. In total, 46 competencies were rated. The two highest ranking competencies having a mean rating of 3.8 were: Have knowledge of production processes and Oversee sanitation standards. Other top ranked competencies with a mean rating from 3.7 to 3.6 dealt with competencies in the areas of Coordinating production control; Product quality; Acquisition of supplies and Training employees.

Competencies rated in the bottom 25 percent and having a mean rating between 3.1 and 1.5 were: Acquisition of raw materials; Union policies; Transportation arrangements; Effective use and modification of manpower machines and equipment; Determining sales; Analyze economic trends and Read flour analysis charts. Being licensed to operate a boiler was rated as being between "Not Important" and "Of Some Importance".

TABLE 2

SUPERVISOR COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=10	Frequency 1	2	3	4	Mean Rating
1	20	Have a knowledge of all production processes.			2	8	3.800
2	31	Oversee sanitation standards.			2	8	3.800
3	21	Coordinate all activities of production.			3	7	3.700
4	37	Direct quality control.			3	7	3.700
5	39	Supervise and coordinate activities of workers engaged in production, manufacturing and processing of products.			3	7	3.700
6	55	Requisition supplies.		1	1	8	3.700
7	58	Be able to use basic mathematics.			3	7	3.700
8	22	Be familiar with plant lay-out.			4	6	3.600
9	40	Train new employees.		1	2	7	3.600
10	54	Compute quantities of materials to be used.		1	2	7	3.600

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TABLE 2 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=10	Frequency 1	2	3	4	Mean Rating
11	61	Identify the purchasing needs for the business.			4	6	3.600
12	63	Reject sub-standard goods and services.		1	2	7	3.600
13	64	Purchase goods or services.			4	6	3.600
14	23	Be familiar with production capacities of each department.			5	5	3.500
15	28	Be aware of raw material sources and supply.		2	1	7	3.500
16	30	Be knowledgeable about all machinery used in the plant.		1	3	6	3.500
17	56	Understand marketing, contract and credit conditions.		1	3	6	3.500
18	57	Have technical knowledge of the materials or products in the products being produced.	1		2	7	3.500
19	26	Plan and develop production procedures.	1		3	6	3.400
20	27	Originate and assess measures to designate or improve production methods, equipment performance and product quality.		1	4	5	3.400
21	36	Oversee the maintenance of plant equipment.			6	4	3.400

TABLE 2 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=10	Frequency 1	2	3	4	Mean Rating
22	41	Instruct employees in the fullfillment of their duties.		1	4	5	3.400
23	45	Interpret company policy and production procedures to subordinates.	1		3	6	3.400
24	50	Supervise apprenticeship or training programs.			6	4	3.400
25	62	Spell out specifications of acceptability for raw materials.	1		3	6	3.400
26	33	Prepare time and cost estimates.		1	5	4	3.300
27	42	Direct activities of subordinate employees.	1		4	5	3.300
28	43	Handle workers grievances.	1	1	2	6	3.300
29	44	Recommend changes in working conditions.		1	5	4	3.300
30	53	Be aware of marketing and distribution problems.	1	1	2	6	3.300
31	59	Estimate price based on market reports, grades, transportation, supplies, etc.	1	1	2	6	3.300
32	35	Prepare production and labor records.		1	6	3	3.200
33	48	Hire and fire employees.		3	2	5	3.200

TABLE 2 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=10	Frequency 1	2	3	4	Mean Rating
34	60	Determine prices of products produced in accordance with state laws.	1	1	3	5	3.200
35	24	Consult with company executives.	2		3	5	3.100
36	25	Confer with department heads to formulate programs regarding availability of raw materials.	2	1	1	6	3.100
37	49	Understand union policy.	2		3	5	3.100
38	65	Arrange for delivery and different modes of transportation.	1	2	2	5	3.100
39	34	Write to supervisors, reports of production figures and completion dates.	3		2	5	2.900
40	47	Project manpower requirements.	1	3	2	4	2.900
41	38	Make modifications in machines and equipment.	1	3	3	3	2.800
42	46	Plan surveys to determine effectiveness of manpower utilization.	1	3	3	3	2.800
43	51	Determine sales forecasts.	1	3	4	2	2.700
44	52	Analyze economic trends.	1	4	2	3	2.700
45	32	Read flour analysis chart provided by mill.	5		3	2	2.200
46	29	Be licensed to operate a boiler.	6	3	1		1.500

Machine Bagger Competencies

The top 25 percent of the Machine Bagger competencies shown in Table 3 were quite varied. The competencies of major concern dealt with: The employees appreciation for sanitary procedures; Being mechanically adept to be able to observe operation malfunctions; Work with motors, conveyors and hopper and Be able to make minor adjustments in the equipment. The above competencies had a mean rating ranging from 3.6 to 3.3.

Job competencies ranking in the bottom 25 percent, as rated by the Machine Bagger, with a mean rating ranging from 2.3 to 1.6 included: Unloading and loading packaged products; Using and caring for machines; Keeping various records and Maintaining union membership.

TABLE 3

MACHINE BAGGER COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Machine Bagger Competencies as Rated by Machine Baggers and Others N=7	Frequency 1	2	3	4	Mean Rating
1	70	Be aware of all sanitary procedures.			3	4	3.571
2	79	Observe operation and detect malfunction.			3	4	3.571
3	71	Accept routine tasks without becoming disinterested.			4	3	3.429
4	94	Feed products onto conveyors, hoppers.		1	2	4	3.429
5	77	Have a basic mechanical ability.		1	3	3	3.286
6	78	Start machines.		2	1	4	3.286
7	81	Report malfunctions of machinery to supervisor.	1		2	4	3.286
8	82	Make minor adjustments to machinery.		1	3	3	3.286
9	88	Set guides.		1	3	3	3.286
10	93	Replenish packaging supplies (wrapping paper, plastic sheeting, boxes, cartons, bags, etc.).		1	3	3	3.286
11	80	Stop machines.		2	2	3	3.143

TABLE 3 - Continued

Rank Order No.	Comp. No.	Machine Bagger Competencies as Rated by Machine Baggers and Others N=7	Frequency 1	2	3	4	Mean Rating
12	86	Adjust conveyors or control valves, spouts, etc. to regulate flow of product.	1		3	3	3.143
13	95	Clear away damaged products or containers.		1	4	2	3.143
14	97	Check to insure finished quality product (proper closing, appearance of carton).	1		3	3	3.143
15	72	Tend machine that performs one or more packaging functions (filling, marking, weighing, wrapping, closing, etc.).		1	5	1	3.000
16	98	Visually inspect materials, products and containers at each step of the packaging process.	1	1	2	3	3.000
17	96	Inspect filled container to insure packaging according to specifications.	2		2	3	2.857
18	84	Open valves.	2		4	1	2.571
19	91	Feed carton into machine and remove them from discharge conveyor.	2	1	2	2	2.571
20	100	Label ingredients according to federal regulations.	3		1	3	2.571
21	74	Convey materials and items from receiving or production areas to storage by hand or using machinery.	2	1	3	1	2.429

TABLE 3 - Continued

Rank Order No.	Comp. No.	Machine Bagger Competencies as Rated by Machine Baggers and Others N=7	Frequency 1	2	3	4	Mean Rating
22	75	Place materials or products on conveyors, pallets or plastic trays.	2	2	1	2	2.429
23	83	Repair machinery.	2	1	3	1	2.429
24	87	Change forming and cutting dies.	3		2	2	2.429
25	85	Weigh containers and adjust quantity.	3	1	1	2	2.286
26	92	Position and hold container in machine.	3	1	1	2	2.286
27	99	Unload packaged product.	2	2	2	1	2.286
28	89	Adjust tension on drive belts, conveyors or chains.	3	1	2	1	2.143
29	90	Lubricate equipment.	4		1	2	2.143
30	101	Record weight, size and type of products packaged.	4		1	2	2.143
31	102	Keep machine yield records.	4		1	2	2.143
32	76	Directly place materials or products on trucks using either hands, hoists, or winches.	4	1	1	1	1.857
33	73	Maintain Union membership.	5		1	1	1.714

TABLE 3 - Continued

Rank Order No.	Comp. No.	Machine Bagger Competencies as Rated by Machine Baggers and Others N=7	Frequency 1	2	3	4	Mean Rating
34	103	Keep and compile stock records.	5		2		1.571
35	104	Keep records of materials or items received or distributed.	5		2		1.571

Routeman Competencies

Bakery Routeman competencies, as indicated in Table 4, reveal that Appropriate licensure; Operation of a vehicle; Certain business form procedures and Being accountable for the merchandise are competencies rating in the top 25 percent and having a mean rating between 3.9 and 3.8.

Of the sixteen competencies rated, all were rated as being between "Important" and "Essential". It can be concluded from these data that this occupation requires specific skills and that this person is particularly important in the products delivery system.

Competencies with a mean rating of between 3.5 and 3.2 and rating in the bottom 25 percent were: Pick up empty containers and rejected merchandise; Balance cash against inventories; Set up sales displays and Call on potential customers.

TABLE 4

ROUTEMAN COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Routeman Competencies as Rated by Routemen and Others N=19	Frequency 1	2	3	4	Mean Rating
1	110	Have the appropriate license if license is required.			1	18	3.947
2	125	Be accountable for the merchandise by charge tickets, cash tickets or returned products.			1	18	3.947
3	116	Write a delivery order.			2	17	3.895
4	111	Drive truck over established route to deliver, sell and display products.		2		17	3.789
5	118	Make collections for deliveries.		1	3	15	3.737
6	115	Inform customers of new products or services.			6	13	3.684
7	119	Place stock on shelves or racks.			6	13	3.684
8	113	Drive truck to deliver items to customer's home or place of business.	1	1	2	15	3.632
9	117	Make out an invoice for merchandise left.		1	5	13	3.632
10	122	Keep records of quantities delivered to customers.			7	12	3.632

TABLE 4 - Continued

Rank Order No.	Comp. No.	Routeman Competencies as Rated by Routemen and Others N=19	Frequency 1	2	3	4	Mean Rating
11	112	Load truck with items.	1	2	1	15	3.579
12	123	Keep records of collections.		2	4	13	3.579
13	121	Collect or pick up empty containers and rejected merchandise.	1		6	12	3.526
14	124	Balance cash against cash inventories.	2		3	14	3.526
15	120	Set up sales displays and posters.	1	1	8	9	3.316
16	114	Call on prospective customers to solicit new business.	1	2	8	8	3.211

Warehouseman Competencies

Bakery Warehouseman competencies were rated by only two employees and appear in Table 5. Because of this, the validity of the mean ratings reported might logically be questioned. The competencies might, however, prove valuable to persons exploring the implications of curriculum development.

TABLE 5

WAREHOUSEMAN COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Warehouseman Competencies as Rated by Warehousemen and Others N=2	Frequency 1	2	3	4	Mean Rating
1	134	Place materials or products on conveyor or truck by hand or hoists, winches, etc.			1	1	3.500
2	146	Fill orders.			1	1	3.500
3	130	Have the strength requirements to lift heavy items.			2		3.000
4	138	Examine stock to verify conformance to specifications.		1		1	3.000
5	141	Store articles in cooler, bins, on floor or shelves according to identifying information.			2		3.000
6	143	Sort products as to size, type or product code.		1		1	3.000
7	135	Count, sort or weigh incoming articles to verify receipt of items on requisitions or invoices.		1	1		2.500
8	137	Fill requisitions, work orders and material requests.	1			1	2.500

TABLE 5 - Continued

Rank Order No.	Comp. No.	Warehouseman Competencies as Rated by Warehousemen and Others N=2	Frequency 1	2	3	4	Mean Rating
9	139	Determine methods of storage and identification; location considering temperature, humidity and height and weight limits.	1			1	2.500
10	142	Insure proper rotation of stock.	1			1	2.500
11	145	Keep records of materials or items received or distributed.		1	1		2.500
12	133	Convey materials and items from receiving or production areas to storage areas by hand or using machinery.		2			2.000
13	140	Prepare shipping tags.	1		1		2.000
14	148	Prepare periodic, special or perpetual inventory of stock.	1		1		2.000
15	132	Receive, store and issue equipment, material supplies, products, etc.	1	1			1.500
16	144	Wrap protective material around product.	1	1			1.500
17	147	Issue supplies from stock.	1	1			1.500
18	131	Maintain Union membership.	2				1.000
19	136	Operate a fork lift machine.	2				1.000

Shipping Clerk

Data in Table 6 shows the mean rating of competencies for the job title Bakery Shipping Clerk.

Thirteen competencies were rated for this job title by three employees. Competencies in the top 25 percent were being able to: Count and compare quantity and identification of units against orders; Select pre-assembled containers; Weigh containers and Pub up salesmen's orders. These competencies had mean ratings ranging from 3.7 to 3.3.

Competencies ranked in the bottom 25 percent were: Assembly and binding of containers using hand or machine equipment with tape, nails or strapping.

TABLE 6

SHIPPING CLERK COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Shipping Clerk Competencies as Rated by Shipping Clerks and Others N=3	Frequency 1	2	3	4	Mean Rating
1	151	Count and compare quantity and identification number of units against order.			1	2	3.667
2	154	Select pre-assembled containers.			1	2	3.667
3	161	Weigh containers.			1	2	3.667
4	152	Put up salesman's orders.		1		2	3.333
5	159	Stamp, stencil or glue identifying information and shipping instructions on containers.		1		2	3.333
6	150	Prepare products for shipment.	1			2	3.000
7	160	Move containers to shipping dock by handtruck, fork lift or overhead hoists.	1			2	3.000
8	162	Attach postage or bill of lading.	1			2	3.000
9	155	Insert items into containers using spacers, fillers, and portective padding.	1		1	1	2.667

TABLE 6 - Continued

Rank Order No.	Comp. No.	Shipping Clerk Competencies as Rated by Shipping Clerks and Others N=3	Frequency 1	2	3	4	Mean Rating
10	153	Assemble wooden or cardboard containers.	1	1		1	2.333
11	158	Bind containers with metal tape by hand or machine.	1	1	1		2.000
12	156	Nail covers on wooden crates.	3				1.000
13	157	Operate strapping machine.	3				1.000

Mixer Competencies

Competencies rated by ten employees in the job title, Mixer, appear in Table 7. Eighteen competencies were validated as being important in this industry. Competencies ranking in the top 25 percent and having a mean rating between 3.7 and 3.6 were: Weigh and measure ingredients; Operate and observe mixers and blending operation and Control equipment temperatures.

Skills or knowledge ranking in the bottom 25 percent were those associated with: Determining time cycles; Handling doughs; Keeping shop schedule and Filling storage tanks or barrels.

TABLE 7

MIXER COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Mixer Competencies as Rated by Mixers and Others N=10	Frequency 1	2	3	4	Mean Rating
1	175	Weigh and measure ingredients.			3	7	3.700
2	170	Tend mixer that mixes and blends ingredients.			4	6	3.600
3	179	Observe mixing to insure thorough blending.			3	6	3.600
4	180	Turn controls to achieve specified temperature.		1	2	7	3.600
5	184	Make finished dough.			4	6	3.600
6	171	Follow formula sheets.	1		2	7	3.500
7	185	Dump dough into trough.		1	4	5	3.400
8	183	Add ingredients as specified during mixing cycle.	1		4	5	3.300
9	176	Dump ingredients into mixing machine.		3	2	5	3.200
10	178	Start machine to mix ingredients for specific times.		3	2	5	3.200
11	172	Estimate size of doughs needed to meet production requirements at start of shift.	1		6	3	3.100

TABLE 7 - Continued

Rank Order No.	Comp. No.	Mixer Competencies as Rated by Mixers and Others N=10	Frequency 1	2	3	4	Mean Rating
12	174	Obtain ingredients.		2	5	3	3.100
13	177	Turn valves.	1	1	4	4	3.100
14	181	Finish sponge.	2		3	5	3.100
15	173	Determine time cycles at start of shift.	1	2	4	3	2.900
16	182	Take sponge from fermentation room.	3		3	4	2.800
17	186	Keep shop schedule or dough sheet.	3	1	1	5	2.800
18	187	Fill storage tanks or barrels.	2	2	2	4	2.800

Divider Operator

There were fifteen validated competencies to which Divider Operators were asked to respond. Four persons responded; data from these responses appear in Table 8.

Competencies rated in the top 25 percent with a mean rating between 3.5 and 3.0 were: Weighing dough with balance scale; Adjusting machine units and Tending and adjusting machines.

Competencies in the bottom 25 percent were: Placing of dough in pans; Adjusting molding machine conveyors; Inspecting dough shapes into pans from molding andSupervising the activities or subordinates.

TABLE 8

DIVIDER OPERATOR COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Divider Operator Competencies as Rated by Divider Operators and Others N=4	Frequency 1	2	3	4	Mean Rating
1	193	Weigh units of dough using balance scale.			2	2	3.500
2	194	Adjust machine when units vary from standard.			2	2	3.500
3	190	Tend machines that automatically divide, round, proof, and shape dough.		1	1	2	3.250
4	191	Adjust handcrank to adjust capacity of dividing compartments.	1		1	2	3.000
5	196	Dust units of dough to prevent sticking.		2		2	3.000
6	204	Keep production records.	1		1	2	3.000
7	195	Scoop flour or starch into sifters.	1	1		2	2.750
8	197	Observe progress of units of dough through machines that automatically round, proof and shape dough.	1		2	1	2.750
9	203	Have a basic mechanical ability.	1		2	1	2.750

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TABLE 8 - Continued

Rank Order No.	Comp. No.	Divider Operator Competencies as Rated by Divider Operators and Others N=4	Frequency 1	2	3	4	Mean Rating
10	192	Adjust speed of feeding conveyor on dividing machine.	2			2	2.500
11	200	Discard misshapen units.	2			2	2.500
12	201	Place dough in pans by hand.	2		1	1	2.250
13	198	Adjust rheostats to control speed of proofing and molding machine conveyors.	3		1		1.500
14	199	Inspect shape units of dough as they are ejected into pans from molding.	3		1		1.500
15	202	Supervise the activities of subordinates.	3		1		1.500

Molder Operator

Four Bakery Molder Operators were interviewed for their reactions to validated competencies on the importance scale. They reacted to sixteen competencies. These reactions appear in the data in Table 9. Ranking in the top 25 percent were: Observe the molder during operation; Adjust or identify machine operation or malfunctions and Inspect shape units of dough as they are ejected into pans from molding machine.

Competencies in the bottom 25 percent for the Molder Operator were those skills and knowledges on the routine matters of the job: Emptying pans into machine; Placing count tags on pans; Pushing rank into proofing box and Keeping production records.

TABLE 9

MOLDER OPERATOR COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Molder Operator Competencies as Rated by Molder Operators and Others N=4	Frequency 1	2	3	4	Mean Rating
1	211	Observe molder during operation.			1	3	3.750
2	217	Adjust machine tension for proper shaping.			1	3	3.750
3	213	Report malfunction to supervisor.	1			3	3.250
4	218	Inspect shape units of dough as they are ejected into pans from molding machine.	1			3	3.250
5	219	Discard misshapen units.	1			3	3.250
6	224	Transfer bread pans to other devices - (monorail racks, bread racks).	1			3	3.250
7	214	Follow make-up sheet.	1		1	2	3.000
8	215	Observe sheeter operation of the molding machine.	1		1	2	3.000
9	216	Adjust sheeting rollers.	1		1	2	3.000

TABLE 9 - Continued

Rank Order No.	Comp. No.	Molder Operator Competencies as Rated by Molder Operators and Others N=4	Frequency 1	2	3	4	Mean Rating
10	221	Unload full pans.	1		1	2	3.000
11	222	Place pans on rack.	1		1	2	3.000
12	212	Observe malfunction of the machine.	2			2	2.500
13	220	Feed empty pans into the machine.	2			2	2.500
14	225	Place count tags on pans.	2			2	2.500
15	223	Push rack into proofing box.	2		1	1	2.250
16	226	Keep production records.	3			1	1.750

Baker-Retail

Seventeen job comptencies were identified and validated for persons whose job title in a retail establishment is Baker. Data in Table 10 provide a mean rating for each competency rated. Competencies having a mean rating in the top 25 percent were being able to: Mix according to specifications by hand or electric mixer; Read and follow recipes; Weigh and measure ingredients and Bake products. These competencies had a mean rating from 3.4 to 3.2.

Competencies rating in the bottom 20 percent with a mean rating from 2.6 to 1.2 were those associated with: Applying surface products to baked goods; Decorating cakes; Developing new recipes and Baking on a grill.

TABLE 10

BAKER-RETAIL COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Baker-Retail Competencies as Rated by Retail Bakers and Others N=14	Frequency 1	2	3	4	Mean Rating
1	276	Mix according to specifications by hand or using electric mixer.		1	6	7	3.429
2	270	Read and follow recipe or formula.	1	1	4	8	3.357
3	272	Weigh and measure ingredients.		3	3	8	3.357
4	277	Bake products.	1	1	6	6	3.214
5	271	Mix and bake ingredients according to recipes.	2		6	6	3.143
6	274	Use scale and graduated containers.	1	3	3	7	3.143
7	282	Observe color of product being baked.		3	6	5	3.143
8	273	Prepare batters, doughs, fillings and icings.	3	1	2	8	3.071
9	280	Bake in oven.	2	1	5	6	3.071
10	278	Roll out and shape dough.	1	3	5	5	3.000
11	275	Dump ingredients into mixing machine, bowl or steam kettle.	2	2	5	5	2.929

TABLE 10 - Continued

Rank Order No.	Comp. No.	Baker-Retail Competencies as Rated by Retail Bakers and Others N=14	Frequency 1	2	3	4	Mean Rating
12	279	Place dough on pans, molds or sheets.	1	4	4	5	2.929
13	283	Regulate oven temperatures.	1	3	6	4	2.929
14	284	Apply glaze, icings or other topping to baked goods using spatula or brush.	4	3	2	5	2.571
15	285	Decorate cakes.	6	1	3	4	2.357
16	286	Develop new recipes for cakes and icings.	9	1	2	2	1.786
17	281	Bake on a grill.	12	1	1		1.214

Bench Hand

Fifteen competencies reported in Table 11 were validated as being important to the job title Bench Hand.

Competencies rating in the top 25 percent were those requiring knowledge and skill in: Reading and following recipes and formulas; Mixing and weighing ingredients; Combining ingredients; Placing doug in pans.

Competencies with mean ratings in the bottom 25 percent were: Kneading dough; Supervising subordinates; Keeping production and time and temperature records.

TABLE 11

BENCH HAND COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Bench Hand Competencies as Rated by Bench Hands and Others N=9	Frequency 1	2	3	4	Mean Rating
1	230	Read and be able to follow a recipe or formula.	1		3	5	3.333
2	231	Mix and weigh ingredients.	1		3	5	3.333
3	232	Combine ingredients.	1		3	5	3.333
4	236	Place shaped dough in greased or floured pans.	1		4	4	3.222
5	237	Spread or sprinkle toppings (jelly, cinnamon, poppy seeds, etc.) on specialities.	1		5	3	3.111
6	234	Cut dough into uniform portions with knife or hand-powered divider.	1	1	4	3	3.000
7	235	Mold dough into loaves or desired shapes.	2		4	3	2.889
8	238	Place pans of dough in proof box to rise.	2		4	3	2.889
9	240	Adjust drafts or thermostatic controls to regulate oven temperatures.	2		4	3	2.889

TABLE 11 - Continued

Rank Order No.	Comp. No.	Bench Hand Competencies as Rated by Bench Hands and Others N=9	Frequency 1	2	3	4	Mean Rating
10	241	Remove baked goods from oven and place on cooling racks.	2	1	3	3	2.778
11	239	Insert pans of raised dough in oven to bake using peel or hook.	3		4	2	2.556
12	233	Knead dough.	4	1	2	2	2.222
13	242	Supervise subordinates.	4	1	3	1	2.111
14	243	Keep production records.	7		1	1	1.556
15	244	Add times and temperatures to dough record sheet.	6	1	2		1.556

Ovenman

Knowledge and skills felt to be of some degree of importance by employees in the job title Overman appear in Table 12.

The top 25 percent of the fifteen competencies were: Remoying racks from proof box; Placing pans on oven shelf and Regulating oven heat and humidity.

Competencies in the bottom 25 percent were: Lubricating ovens; Removing baked goods from oven; Controlling oven and Oiling and adjusting oven conveyor chains.

TABLE 12

OVENMAN COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Overman Competencies as Rated by Overmen and Others N=8	Frequency 1	2	3	4	Mean Rating
1	250	Remove racks from proof box.		1	2	5	3.500
2	252	Place pans of unbaked goods on oven shelf.		1	2	5	3.500
3	253	Open oven door and slide products in for baking.		1	2	5	3.500
4	254	Observe and adjust gauges and turn valves to regulate heat or humidity of oven.		1	3	4	3.375
5	256	Note color of product during baking to insure uniformity of finished products.	1		2	5	3.375
6	261	Adjust timing and temperatures for different products for uniform merchandise.	1		2	5	3.375
7	251	Tend stationary or rotary hearth oven that bakes bread, pastries, etc.	1		3	4	3.250
8	255	Observe the overall automatic operation of the oven - loading and unloading.	1		3	4	3.250
9	258	Flip switch to position hearth for loading and unloading when tending rotary hearth oven.	2	1	3	2	2.625

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TABLE 12 - Continued

Rank Order No.	Comp. No.	Overman Competencies as Rated by Ovenmen and Others N=8	Frequency 1	2	3	4	Mean Rating
10	262	Clean ovens.	3		2	3	2.625
11	260	Verify production count.	3	1	1	3	2.500
12	263	Lubricate ovens.	4		2	2	2.250
13	257	Remove baked goods from oven with hook and place them on tiered racks.	4	1	2	1	2.000
14	259	Control reel or conveyor type oven.	5	1	1	1	1.750
15	264	Oil and adjust oven conveyor chains.	6	1		1	1.500

Hand Bagger

The data in Table 13 ranks in order of importance the nine competencies validated for the job title Hand Bagger.

Two competencies having a mean rating ranging from 3.3 to 3.8 were of primary importance. They were: Wrapping protective material around product and Obtaining and sorting products. Other competencies ranking between being "Important" or "Essential" were" Labeling in accordance with federal regulations; Packing selections and arranging products and Wrapping products for shipping. The lowest ranked competency was Operating the conveyor belt.

TABLE 13

HAND BAGGER COMPETENCIES IN THE BAKERY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Hand Bagger Competencies as Rated by Hand Baggers and Others N=8	Frequency 1	2	3	4	Mean Rating
1	291	Wrap protective material around product.	1		2	5	3.375
2	290	Obtain and sort products.	1	1	1	5	3.250
3	298	Label ingredients according to federal regulations.	2		1	5	3.125
4	294	Pack special selections or arrangements of products.	1	2	1	4	3.000
5	297	Wrap products for shipping, storage.	2		2	4	3.000
6	295	Visually inspect materials, products, and containers at each step of the packaging process.	2		4	2	2.750
7	296	Record information as to weight, date and time on filled containers.	3	1	2	2	2.375
8	293	Sort bundles of filled containers.	4	1		3	2.250
9	292	Start, stop and regulate speed of the conveyor belt.	5		1	2	2.000

Dairy Industry:

The dairy industry is concentrated in the irrigated, agricultural areas of Montana and is characterized by smaller processors. However, there are a few large plants who are essentially involved in the processing and distribution of whole milk. The industry is somewhat threatened by the regionalization of larger outside plants which also process specialized products such as butter and cheese. Table 14 through 23 contain ratings of competencies for various job titles in the dairy industry.

Personal Qualities

All persons interviewed within the dairy products industries were asked to react to the Personal Quality competencies. The same Personal Quality competencies were used in each job title within the four broad industrial areas. Seventy-four persons reacted to the Personal Quality competencies in the dairy industry. This appears in Table 14.

Those competencies in the top 25 percent with a mean rating from 3.8 to 3.7 were: Willingness to work; Satisfactory attendance records; Follow directions and Demonstrating a desirable job attitude.

Competencies in the bottom 25 percent with a mean ranging from 3.5 to 3.4 were: Demonstrate ability to work as a team member; Acceptable personal appearance and hygiene and Accept routine tasks. All of the personal competencies had a mean rating indicating them to be between "Important" and "Essential".

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TABLE 14

PERSONAL QUALITIES COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Dairy Industry N=74	Frequency 1	2	3	4	Mean Rating
1	1	Demonstrate a willingness to work.		1	14	59	3.784
2	12	Maintain a satisfactory attendance record.		1	22	51	3.676
3	3	Demonstrate the ability to follow directions of supervisor.		1	23	50	3.662
4	8	Demonstrate a desirable job attitude about the organization when working with fellow employees, potential customers and customers.		4	17	53	3.662
5	5	Demonstrate the ability to get along with others.		2	23	49	3.635
6	6	Work safely and neatly.			27	47	3.635
7	2	Demonstrate a willingness to learn or take supervision.		5	20	49	3.595
8	4	Demonstrate the ability to work independently.		5	21	48	3.581
9	10	Demonstrate the ability to project a desirable image for the firm.		2	29	43	3.554

TABLE 14 - Continued

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Dairy Industry N=74	Frequency 1	2	3	4	Mean Rating
10	7	Demonstrate the ability to work cooperatively as a member of a team.	1	3	25	45	3.541
11	9	Demonstrate acceptable personal appearance and personal hygiene.		5	27	42	3.500
12	11	Accept routine tasks without becoming disinterested.		5	33	36	3.419

Plant Supervisor

Twenty-two persons reacted to competencies of some degree of importance to the job title Plant Supervisor. Reactions to the forty-six validated competencies appear in Table 15.

Appearing in the top 25 percent and having a mean rating ranging between 3.4 and 3.6 were: Coordinating production activities; Supervising workers; Rejecting sub-standard goods and services; Being familiar with production capacities, plant layout and sanitation procedures; Using basic mathematics; Computing consumable materials; Consulting with executives; Assessing methods to improve production methods, equipment performance and product quality.

Competencies in the lowest 25 percent and having a mean rating between 1.2 and 2.8 were: Writing reports and keeping records; Awareness of marketing problems; Conducting plant surveys; Arranging transportation; Being a licensed boiler operator; Estimating and determining prices and sales; Understanding union policy; Analyzing economic trends and Reading a flour analysis chart.

TABLE 15

PLANT SUPERVISOR COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Plant Supervisor Competencies as Rated by Plant Supervisors and Others N=22	Frequency 1	2	3	4	Mean Rating
1	21	Coordinate all activities of production.		3	2	17	3.636
2	39	Supervise and coordinate activities of workers engaged in production, manufacturing and processing of products.		1	6	15	3.636
3	20	Have a knowledge of all production processes.	1	1	4	16	3.591
4	63	Reject sub-standard goods and services.		2	6	14	3.545
5	23	Be familiar with production capacities of each department.	1		8	13	3.500
6	22	Be familiar with plant lay-out.		3	6	13	3.455
7	26	Plan and develop production procedures.		1	10	11	3.455
8	31	Oversee sanitation standards.	1	1	7	13	3.455
9	54	Compute quantities of materials to be used.		2	8	12	3.455

TABLE 15 - Continued

Rank Order No.	Comp. No.	Plant Supervisor Competencies as Rated by Plant Supervisors and Others N=22	Frequency 1	2	3	4	Mean Rating
10	58	Be able to use basic mathematics.		1	10	11	3.455
11	24	Consult with company executives.	1	1	8	12	3.409
12	27	Originate and assess measures to designate or improve production methods, equipment performance and product quality.		3	8	11	3.364
13	64	Purchase goods or services.		2	10	10	3.364
14	36	Oversee the maintenance of plant equipment.	1	3	6	12	3.318
15	37	Direct quality control.	1	2	8	11	3.318
16	28	Be aware of raw material sources and supply.	1	2	9	10	3.273
17	57	Have technical knowledge of the materials or products in the products being produced.	2	1	8	11	3.273
18	25	Confer with department heads to formulate programs regarding availability of raw materials.	2	2	7	11	3.227
19	30	Be knowledgeable about all machinery used in the plant.	1	4	6	11	3.227
20	40	Train new employees.	1	1	13	7	3.182

TABLE 15 - Continued

Rank Order No.	Comp. No.	Plant Supervisor Competencies as Rated by Plant Supervisors and Others N=22	Frequency 1	2	3	4	Mean Rating
21	41	Instruct employees in the fullfillment of their duties.	1	2	11	8	3.182
22	47	Project manpower requirements.	2	1	10	9	3.182
23	48	Hire and fire employees.	2	2	8	10	3.182
24	62	Spell out specifications of acceptability for raw materials.	1	3	9	9	3.182
25	42	Direct activities of subordinate employees.	1	3	10	8	3.136
26	55	Requisition supplies.	2	1	11	8	3.136
27	61	Identify the purchasing needs for the business.	2	3	7	10	3.136
28	44	Recommend changes in working conditions.		3	14	5	3.091
29	45	Interpret company policy and production procedures to subordinates.	1	4	10	7	3.045
30	43	Handle workers grievances.	1	4	13	4	2.909
31	50	Supervise apprenticeship or training programs.	3	4	7	8	2.909
32	33	Prepare time and cost estimates.	3	4	8	7	2.864

TABLE 15 - Continued

Rank Order No.	Comp. No.	Plant Supervisor Competencies as Rated by Plant Supervisors and Others N=22	Frequency 1	2	3	4	Mean Rating
33	38	Make modifications in machines and equipment.	1	6	10	5	2.864
34	56	Understand marketing, contract and credit conditions.	2	5	9	6	2.864
35	34	Write to supervisors, reports of production figures and completion dates.	3	5	7	7	2.818
36	35	Prepare production and labor records.	2	7	7	6	2.773
37	53	Be aware of marketing and distribution problems.	3	4	10	5	2.773
38	46	Plant surveys to determine effectiveness of manpower utilization.	2	5	12	3	2.727
39	65	Arrange for delivery and different modes of transportation.	4	5	7	6	2.682
40	29	Be licensed to operate a boiler.	6	5	2	9	2.636
41	59	Estimate price based on market reports, grades, transportation, supplies, etc.	5	5	7	5	2.545
42	60	Determine prices of products produced in accordance with state laws.	5	5	7	5	2.545
43	51	Determine sales forecasts.	5	4	10	3	2.500

TABLE 15 - Continued

Rank Order No.	Comp. No.	Plant Supervisor Competencies as Rated by Plant Supervisors and Others N=22	Frequency 1	2	3	4	Mean Rating
44	49	Understand union policy.	7	3	7	5	2.455
45	52	Analyze economic trends.	7	3	8	4	2.409
46	32	Read flour analysis chart provided by mill.	20	1		1	1.182

Machinery Operator

The Machinery Operator competencies were rated by twenty-two employees. Competency means were computed and the 35 competencies were ranked in order; these data appear in Table 16.

Competencies appearing in the top 25 percent with mean ratings from 3.8 to 3.5 were: Inspection of filled containers; Quality of finished products; Assuring sanitary procedures; Reporting malfunctions of machinery; Replenishing packaging supplies; Unloading packaged products and Weighing and adjusting container quantity.

Competencies with a mean rating ranging from 3.0 to 2.2 and which were ranked in the lowest 25 percent of the competencies were: Conveyance of materials; Setting guides; Keeping records; Adjusting conveyance machinery; Adjusting and repairing machinery and Maintaining union membership.

TABLE 16

MACHINERY OPERATOR COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Machinery Operator Competencies as Rated by Machinery Operators and Others N=22	Frequency 1	2	3	4	Mean Rating
1	96	Inspect filled container to insure packaging according to specifications.	1		2	19	3.773
2	97	Check to insure finished quality product (proper closing, appearance of carton).	1		2	19	3.773
3	98	Visually inspect materials, products and containers at each step of the packaging process.	1		3	18	3.727
4	70	Be aware of all sanitary procedures.			9	13	3.591
5	81	Report malfunctions of machinery to supervisor.	1	2	2	17	3.591
6	93	Replenish packaging supplies (wrapping paper, plastic sheeting, boxes, cartons, bags, etc.).	1	1	5	15	3.545
7	99	Unload packaged product.	1	1	5	15	3.545
8	85	Weigh containers and adjust quantity.	2		5	15	3.500
9	84	Open valves.	1	1	7	13	3.455

TABLE 16 - Continued

Rank Order No.	Comp. No.	Machinery Operator Competencies as Rated by Machinery Operators and Others N=22	Frequency 1	2	3	4	Mean Rating
10	86	Adjust conveyors or control valves, spouts, etc. to regulate flow of product.	2		6	14	3.455
11	100	Label ingredients according to federal regulations.	3		3	16	3.455
12	101	Record weight, size and type of products packaged.	3	1	1	17	3.455
13	79	Observe operation and detect malfunction.	1	1	8	12	3.409
14	71	Accept routine tasks without becoming disinterested.			14	8	3.364
15	90	Lubricate equipment.	2	2	4	14	3.364
16	80	Stop machines.	1	1	10	10	3.318
17	94	Feed products onto conveyors, hoppers.	3	2	2	15	3.318
18	72	Tend machine that performs one or more packaging functions (filling, marking, weighing, wrapping, closing, etc.).	1	1	11	9	3.273
19	78	Start machines.	1	2	9	10	3.273
20	82	Make minor adjustments to machinery.	1	2	10	9	3.227

TABLE 16 - Continued

Rank Order No.	Comp. No.	Machinery Operator Competencies as Rated by Machinery Operators and Others N=22	Frequency 1	2	3	4	Mean Rating
21	91	Feed carton into machine and remove them from discharge conveyor.	3	1	6	12	3.227
22	95	Clear away damaged products or containers.	2	4	3	13	3.227
23	102	Keep machine yield records.	2	2	7	11	3.227
24	75	Place materials or products on conveyors, pallets or plastic trays.	1	3	11	7	3.091
25	103	Keep and compile stock records.	3	2	7	10	3.091
26	77	Have a basic mechanical ability.	1	3	12	6	3.045
27	92	Position and hold container in machine.	4	2	5	11	3.045
28	74	Convey materials and items from receiving or production areas to storage by hand or using machinery.	2	3	10	7	3.000
29	88	Set guides.	3	3	7	9	3.000
30	104	Keep records of materials or items received or distributed.	3	3	8	8	2.955
31	89	Adjust tension on drive belts, conveyors or chains.	4	3	6	9	2.909

TABLE 16 - Continued

Rank Order No.	Comp. No.	Machinery Operator Competencies as Rated by Machinery Operators and Others N=22	Frequency 1	2	3	4	Mean Rating
32	76	Directly place materials or products on trucks using either hands, hoists, or winches.	3	3	12	4	2.773
33	83	Repair machinery.	2	7	7	6	2.773
34	87	Change forming and cutting dies.	6	3	4	9	2.727
35	73	Maintain Union membership.	8	5	5	4	2.227

Cooler Man

Nineteen competencies were rated by fifteen Cooler Men. A rank order by mean appears in Table 17. Insure the proper rotation of stock; Count, rotate or weigh incoming articles to verify receipt; Convey materials by hand or machine; Sort articles and products according to size or type were the competencies ranking in the top 25 percent.

Those in the lowest 25 percent were knowledge and skills involved in: Issuing supplies; Preparing inventories and shipping tags; Maintaining union membership; Wrapping products and Operating a fork lift.

TABLE 17

COOLER MAN COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Cooler Man Competencies as Rated by Cooler Men and Others N=15	Frequency 1	2	3	4	Mean Rating
1	142	Insure proper rotation of stock.	1		5	9	3.467
2	135	Count, sort or weigh incoming articles to verify receipt of items on requisitions or invoices.	1	1	6	7	3.267
3	133	Convey materials and items from receiving or production areas to storage areas by hand or using machinery.	1	1	7	6	3.200
4	141	Store articles in cooler, bins, on floor or shelves according to identifying information.	1	1	8	5	3.133
5	143	Sort products as to size, type or product code.	1	1	8	5	3.133
6	138	Examine stock to verify conformance to specifications.	1	1	9	4	3.067
7	139	Determine methods of storage and identification; location considering temperature, humidity and height and weight limits.	3		5	7	3.067
8	146	Fill orders.	2	1	6	6	3.067

TABLE 17 - Continued

Rank Order No.	Comp. No.	Cooler Man Competencies as Rated by Cooler Men and Others N=15	Frequency 1	2	3	4	Mean Rating
9	130	Have the strength requirements to lift heavy items.	2	2	6	5	2.933
10	134	Place materials or products on conveyor or truck by hand or hoists, winches, etc.	1	3	7	4	2.933
11	132	Receive, store and issue equipment, material supplies, products, etc.	2	2	7	4	2.867
12	145	Keep records of materials or items received or distributed.	3	1	7	4	2.800
13	137	Fill requisitions, work orders and material requests.	3	2	6	4	2.733
14	147	Issue supplies from stock.	5		5	5	2.667
15	148	Prepare periodic, special or perpetual inventory of stock.	4	2	5	4	2.600
16	140	Prepare shipping tags.	3	4	5	3	2.533
17	131	Maintain Union membership.	6	3	2	4	2.267
18	144	Wrap protective material around product.	6	3	3	3	2.200
19	136	Operate a fork lift machine.	7	2	5	1	2.000

Routeman

Competencies rated by Routeman (dairy) appear in Table 18. Fifteen persons reacted to sixteen validated occupational competencies. Rating in the top 25 percent with a mean rating of 3.7 to 3.6 were: Being properly licensed; Driving delivery truck over established route; Making collections for delivery and Loading truck with products. Of equal importance were the competencies related to: Writing a delivery order and Making out an invoice.

Knowledge and skills with a mean rating of between 3.4 and 2.9 were: Soliciting new business; Disseminating new products or services; Stocking shelves; Keeping records; Picking up empty containers; Balancing cash against inventory and Setting up sales displays.

TABLE 18

ROUTEMAN COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Routeman Competencies as Rated by Routemen and Others N=15	Frequency 1	2	3	4	Mean Rating
1	110	Have the appropriate license if license is required.		1	2	12	3.733
2	111	Drive truck over established route to deliver, sell and display products.			4	11	3.733
3	118	Make collections for deliveries.			5	10	3.677
4	112	Load truck with items.		1	4	10	3.600
5	113	Drive truck to deliver items to customer's home or place of business.	1		3	11	3.600
6	116	Write a delivery order.	1		3	11	3.600
7	117	Make out an invoice for merchandise left.	1		3	11	3.600
8	123	Keep records of collections.	1		4	10	3.533
9	125	Be accountable for the merchandise by charge tickets, cash tickets or returned products.	2		2	11	3.467

TABLE 18 - Continued

Rank Order No.	Comp. No.	Routeman Competencies as Rated by Routemen and Others N=15	Frequency 1	2	3	4	Mean Rating
10	114	Call on prospective customers to solicit new business.			9	6	3.400
11	115	Inform customers of new products or services.	1	1	4	9	3.400
12	119	Place stock on shelves or racks.	1	1	4	9	3.400
13	122	Keep records of quantities delivered to customers.	2		3	10	3.400
14	121	Collect or pick up empty containers and returned merchandise.	1		7	7	3.333
15	124	Balance cash against book inventories.	2	1	2	10	3.333
16	120	Set up sales displays and posters.	2	2	6	5	2.933

Buttermaker

The data in Table 19 summarizes the rating given competencies in the job title Buttermaker. Eleven persons ranked the following competencies in the top 25 percent: Maintenance of temperature; Be able to pasteurize cream; Test for moisture; Add or remove water; Operate a churn; Test butter for consistency and conduct various butter tests; Be familiar with sanitary procedures and Keep yield records.

Competencies whose mean rating appeared in the lowest 25 percent were: Connect cream pipes to churn; Start churn; Spray butter; Determine amounts of ingredients; Grade butter; Control equipment to make butter grades and Separate cream to obtain butter oil.

TABLE 19

BUTTERMAKER COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Buttermaker Competencies as Rated by Buttermakers and Others N=11	Frequency 1	2	3	4	Mean Rating
1	358	Maintain proper temperatures.	1			10	3.727
2	370	Pasteurize cream.	1			10	3.727
3	364	Test butter for moisture.	1		1	9	3.636
4	367	Add or remove water as required.	1		1	9	3.636
5	351	Operate a butter churn.	1		2	8	3.545
6	366	Test butter for consistency.	1		2	8	3.545
7	376	Turn valves and regulate gauges to regulate temperature.	1		2	8	3.545
8	378	Test sample by smell, taste and feel to grade butter.	1		2	8	3.545
9	379	Be acquainted with all sanitary procedures.	1		2	8	3.545
10	382	Keep yield records.	1		2	8	3.545

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TABLE 19 - Continued

Rank Order No.	Comp. No.	Buttermaker Competencies as Rated by Buttermakers and Others N=11	Frequency 1	2	3	4	Mean Rating
11	365	Test butter for salt content.	1		3	7	3.455
12	373	Use testing equipment.	1		3	7	3.455
13	374	Read gauges.	1		3	7	3.455
14	381	Keep production records.	1		3	7	3.455
15	353	Start pump to convey sterile solution through equipment.	1		4	6	3.364
16	357	Observe separation of buttermilk from butter.	1		4	6	3.364
17	372	Test for salt content and acidity.	1	1	2	7	3.364
18	354	Test cream for butterfat.	1	2	1	7	3.273
19	355	Admit measured amount of pasteurized cream into churn.	1	1	3	6	3.273
20	359	Pump buttermilk from churn.	2		2	7	3.273
21	360	Open churn.	1	2	1	7	3.273
22	380	Supervise the activities of subordinates.	1		5	5	3.273

TABLE 19 - Continued

Rank Order No.	Comp. No.	Buttermaker Competencies as Rated by Buttermakers and Others N=11	Frequency 1	2	3	4	Mean Rating
23	352	Connect sanitary pipe between cream storage vat and churn.	1	1	4	5	3.182
24	356	Start churn.	1	1	4	5	3.182
25	361	Spray butter with cholorinated water to remove residue buttermilk.	1		6	4	3.182
26	375	Determine necessary amounts of ingredients to add for specified grade.	2		3	6	3.182
27	363	Add coloring to meet specifications.	2		4	5	3.091
28	368	Grade butter according to prescribed standards.	1	1	5	4	3.091
29	350	Control equipment to make grades of butter.	3	1	1	6	2.909
30	362	Compare butter with color chart.	2		6	3	2.909
31	369	Make butter by the butter chilling method.	3	2	3	3	2.545
32	377	Turn valves and regulate gauges to regulate flow of water, refrigerant and butter oil through chilling vat.	4	1	2	4	2.545
33	371	Separate cream to obtain butter oil.	7		2	2	1.909

Cheesemaker

Fourteen persons reacted to the validated competency instrument on the importance of certain competencies to the job title Cheesemaker.

The mean rating of the knowledge and skills appear in Table 20. Those competencies appearing in the top 25 percent with a mean rating from 3.7 to 3.6 were: Cook milk; Follow directions; Control temperatures; Determine firmness and texture; Observe sanitary procedures; Operate agitator; Determine rennet to be added and Pulling curd knives.

Competencies whose mean ratings were among the lowest 25 percent were: Securing ingredients; Filling vats; Determining acidity; Keeping records; Having mechanical ability; Separating curds and Directing activities of Subordinates.

TABLE 20

CHEESE MAKER COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Cheese Maker Competencies as Rated by Cheese Makers and Others N=14	Frequency 1	2	3	4	Mean Rating
1	387	Cook milk and specified ingredients to make cheese according to formula.	1		1	12	3.714
2	386	Read and follow a recipe and formula.		1	3	10	3.643
3	400	Cook curd at prescribed temperature.	1		2	11	3.643
4	401	Determine desired firmness and texture.	1		2	11	3.643
5	385	Be acquainted with all sanitation procedures.		1	4	9	3.571
6	391	Heat milk to specified temperature.	1		3	10	3.571
7	393	Operate agitator to mix ingredients.	1		3	10	3.571
8	395	Determine amount of rennet to be added.	1		3	10	3.571
9	397	Pull curd knives through curd.	1		3	10	3.571
10	399	Observe thermometer and regulate heat.	1		3	10	3.571
11	394	Determine acidity by testing milk sample.	1		4	9	3.500

TABLE 20 - Continued

Rank Order No.	Comp. No.	Cheese Maker Competencies as Rated by Cheese Makers and Others N=14	Frequency 1	2	3	4	Mean Rating
12	389	Pasteurize and separate milk to obtain prescribed butterfat content.		3	2	9	3.429
13	392	Determine proper quantity and type of dye and starter to be added to milk.	2		2	10	3.429
14	396	Determine when to stop agitator to allow milk to coagulate into curd.	2		2	10	3.429
15	404	Taste, smell, feel and observe sample for quality.	1	1	3	9	3.429
16	406	Keep records of time cycles.	1	1	3	9	3.429
17	407	Keep yield records.	1		5	8	3.429
18	388	Secure the necessary ingredients.	2	1	1	10	3.357
19	390	Adjust valves to fill vat with milk.	2		3	9	3.357
20	402	Determine the finished acidity of product.	2		4	8	3.286
21	405	Keep records of ingredients used.	2	1	3	8	3.214
22	408	Have basic mechanical ability.		2	7	5	3.214
23	398	Separate curds with hand scoop to release whey.	3	1	2	8	3.071
24	403	Direct activities of subordinates.	1	2	7	4	3.000

Pasteurizer

The job title Pasteurizer was rated by nineteen persons; the mean ratings are ranked in Table 21. The top ranked competencies with a mean rating ranging between 3.6 and 3.3 were: Acquainted with sanitary procedures; Keep products clean; Operator homogenizer and pumps; Kill bacteria and Know proper temperatures for pasteurizing.

The knowledge and skills which pasteurizers ranked in the lowest 25 percent were: Keeping of records; Inventories; Advising supervisor about products needed; Regulating temperature for tester freezing and Maintaining union membership.

TABLE 21

PASTEURIZER COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Pasteurizer Competencies as Rated by Pasteurizers and Others N=19	Frequency 1	2	3	4	Mean Rating
1	459	Be acquainted with all sanitation procedures.	2		2	15	3.579
2	458	Insure that food products are kept clean.	2		4	13	3.474
3	447	Operate homogenizers.	2	2	3	12	3.316
4	457	Kill bacteria, especially pathogens.	3		4	12	3.316
5	446	Operate timing pumps.	3	1	3	12	3.263
6	460	Clean and sterilize equipment.	4		2	13	3.263
7	461	Have a knowledge of proper temperatures for pasteurizing.	3		5	11	3.263
8	448	Assemble machinery.	2	3	3	11	3.211
9	445	Know the operation of machinery to adjust pressure, etc.	2	2	6	9	3.158
10	449	Regulate temperatures.	3	1	5	10	3.158

TABLE 21 - Continued

Rank Order No.	Comp. No.	Pasteurizer Competencies as Rated by Pasteurizers and Others N=19	Frequency 1	2	3	4	Mean Rating
11	440	Execute the duties of a lead man for producing quality products.	4		5	10	3.105
12	451	Read and interpret a formula or recipe.	3	3	2	11	3.105
13	462	Pasteurize by holding method.	3	1	6	9	3.105
14	463	Regulate the bacterial count by controlling temperatures.	3	2	5	9	3.053
15	452	Mix and blend ingredients thoroughly.	3	3	4	9	3.000
16	454	Determine the proper butterfat content of products.	4		8	7	2.947
17	444	Have a basic mechanical ability.	2	4	7	6	2.895
18	456	Prepare mix for homogenizing.	5		6	8	2.895
19	450	Operate vacuum pasteurizer.	5	1	5	8	2.842
20	455	Dissolve sugar, dry milk, egg yolk, etc.	4	3	4	8	2.842
21	464	Regulate temperatures to lower viscosity of mix (less fat clumping).	4	2	6	7	2.842
22	441	Supervise subordinates activities.	3	3	8	5	2.789

TABLE 21 - Continued

Rank Order No.	Comp. No.	Pasteurizer Competencies as Rated by Pasteurizers and Others N=19	Frequency 1	2	3	4	Mean Rating
23	466	Keep production records.	4	2	8	5	2.737
24	468	Keep inventories (freezers, supplies).	4	4	6	5	2.632
25	467	Keep records of yield.	6	1	7	5	2.579
26	442	Advise plant foreman or supervisor of materials or products needed.	6	2	6	5	2.526
27	453	Melt butter.	8	2	3	6	2.368
28	465	Regulate temperature for tester freezing in batch freezer.	8	2	4	5	2.316
29	443	Maintain Union membership.	10	4	2	3	1.895

Laboratory Technician

Eleven laboratory technicians rated the competencies for the job title Laboratory Technician. These data appear in Table 22.

Performing lab tests properly; Rejecting impure samples; Using clean lab equipment; Performing quality control functions; Being familiar with sanitary procedures and Keeping test records were the competencies ranking among the highest 25 percent.

Those rating among the bottom 25 percent with mean ratings between 1.9 and 2.7 were: Testing for penicillin; Supervising subordinates; Determining composition of solid, liquid or gaseous materials, Operating agitators, condensers, vibrating screens and Maintaining Union membership.

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TABLE 22

LABORATORY TECHNICIAN COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Laboratory Technician Competencies as Rated by Laboratory Technicians and Others N=11	Frequency 1	2	3	4	Mean Rating
1	411	Perform laboratory tests according to prescribed standards.			3	8	3.727
2	430	Reject impure samples.			4	7	3.636
3	432	Clean and sterilize laboratory equipment.		1	3	7	3.545
4	414	Determine product substances for quality control, process control and/or product development.			6	5	3.455
5	425	Test samples of manufactured products for quality control.	1		3	7	3.455
6	431	Be familiar with all sanitary procedures.		1	4	6	3.455
7	433	Keep records of tests made.	1		3	7	3.455
8	419	Operate centrifuges.	1	1	2	7	3.364
9	423	Propogate starters and cultures.	2		1	8	3.364
10	426	Execute several tests for butter fats and solids.	1	1	2	7	3.364

TABLE 22 - Continued

Rank Order No.	Comp. No.	Laboratory Technician Competencies as Rated by Laboratory Technicians and Others N=11	Frequency 1	2	3	4	Mean Rating
11	435	Keep inventories of materials and supplies.	1		4	6	3.364
12	438	Communicate test results directly to plant manager.		1	5	5	3.364
13	424	Test samples of milk from bulk transports.	2		2	7	3.273
14	427	Test for bacterial counts.	2		2	7	3.273
15	410	Meet the qualifications for licensing.	2		3	6	3.182
16	412	Determine chemical and physical characteristics of products.		2	5	4	3.182
17	417	Operate grinders or blenders.	1	2	3	5	3.091
18	434	Keep records of quality control measures.	2		4	5	3.091
19	416	Adjust laboratory apparatus.	1	2	4	4	3.000
20	420	Operate ovens.	2	2	2	5	2.909
21	429	Test for WMT (Wisconsin Mastitis Test).	3		3	5	2.909
22	415	Set up laboratory apparatus.	2	2	3	4	2.818
23	428	Test for penicillin.	3	1	3	4	2.727

TABLE 22 - Continued

Rank Order No.	Comp. No.	Laboratory Technician Competencies as Rated by Laboratory Technicians and Others	Frequency				Mean Rating
			1	2	3	4	
24	437	Supervise activities of subordinates.	2	2	4	3	2.727
25	413	Determine the composition of solid, liquid or gaseous materials.	1	4	4	2	2.636
26	418	Operate agitator.	4		4	3	2.545
27	421	Operate condensers.	5	1	3	2	2.182
28	422	Operate vibrating screens.	6	1	2	2	2.000
29	436	Maintain Union membership.	5	4		2	1.909

Ice Cream Maker

Ice Cream Maker competencies were rated by thirty-eight persons. Data from these responses appear in Table 23. Competencies ranking in the top 25 percent with a mean rating from 3.0 to 3.5 were: Blending formulas; following recipes; Cleaning and sterilizing equipment; Knowing sanitation procedures; Weighing and measuring ingredients and Having a knowledge of flavoring and ingredients.

Knowledge and skills ranked among the lowest 25 percent were: Operating pumps; Adjusting pressure gauges; Regulating filling valves; Keeping inventories; Regulating pumps; Supervising subordinates and Inserting novelty dies to form center designs.

TABLE 23

ICE CREAM MAKER COMPETENCIES IN THE DAIRY INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Ice Cream Maker Competencies as Rated by Ice Cream Makers and Others N=38	Frequency 1	2	3	4	Mean Rating
1	472	Blend ingredients according to formula for ice cream.	2	1	2	15	3.500
2	471	Read and follow a recipe and formula.	2	1	4	13	3.400
3	492	Clean and sterilize equipment.	3		4	13	3.350
4	491	Be acquainted with all sanitation procedures.	3		5	12	3.300
5	474	Weigh and measure ingredients (with pasteurizer).	4		4	12	3.200
6	488	Weigh package.	4		4	12	3.200
7	473	Have knowledge of flavoring and ingredients.	3		16	7	3.050
8	476	Fill hopper of feeder with candy, fruits and nuts using scoop.	4		8	8	3.000
9	493	Keep blades of freezers sharp and honed.	4		8	8	3.000
10	481	Regulate and inject air into mix.	4	1	7	8	2.950

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TABLE 23 - Continued

Rank Order No.	Comp. No.	Ice Cream Maker Competencies as Rated by Ice Cream Makers and Others N=38	Frequency 1	2	3	4	Mean Rating
11	484	Adjust controls to obtain specified freezing temperature, air pressure and machine speed.	5		6	9	2.950
12	487	Adjust filler head to insure proper amount of product in each container.	5		6	9	2.950
13	470	Operate one or more continuous freezers and other equipment.	4	1	9	6	2.850
14	482	Start beater, scraper and expeller blades to mix contents.	5		8	7	2.850
15	489	Assemble pipes, fittings and equipment for operation using wrench.	4	4	4	8	2.800
16	490	Assemble freezer.	6		6	8	2.800
17	494	Keep production records.	5	1	7	7	2.800
18	479	Regulate valves to force mix into freezer barrels.	6	1	5	8	2.750
19	480	Determine the amount of refrigerant to be used in freezer coils to maintain proper temperature.	6		7	7	2.750
20	496	Keep ingredient inventories.	5	1	8	6	2.750

TABLE 23 - Continued

Rank Order No.	Comp. No.	Ice Cream Maker Competencies as Rated by Ice Cream Makers and Others N=38	Frequency 1	2	3	4	Mean Rating
21	497	Keep yield records.	5	2	6	7	2.750
22	475	Operate pumps.	6	1	6	7	2.700
23	483	Observe and adjust ammeter and pressure gauge.	6		8	6	2.700
24	485	Regulate valve to transfer contents to filling machine to fill cartons, cups, cones or molds.	6		8	6	2.700
25	495	Keep ice cream freezer inventories.	5	3	5	7	2.700
26	478	Regulate rippling pump.	6	2	6	6	2.600
27	498	Supervise subordinates activities.	6	3	6	5	2.500
28	477	Pour syrups into holder of rippling pump.	7	2	6	5	2.450
29	486	Insert novelty dies in filler head to separate flavors and form center designs.	8	2	7	3	2.250

8. Meat Industry:

Montana has three large packing plants in which the duties for employees are highly specified. In addition there are a large number of small isolated slaughtering houses and meat processing plants in the state. Several of the smaller operations expressed their need for competent assistants with some training. Conversely, due to specialization, the large packing plants desire to train their own employees for their unique operation.

Personal Qualities

Personal qualities competencies were administered to 54 employees in the six job titles in the meat industry. The data in Table 24 shows that being able to: Follow directions; Take supervision; and Demonstrate a willingness to work were those competencies which ranked among the highest 25 percent. All of the personal qualities on the importance scale were valued by employees to be either "Important" or "Essential".

Working independently; Projecting a desirable firm image and Accepting routine tasks without becoming disinterested were the competencies which ranked in the bottom 25 percent.

TABLE 24

PERSONAL QUALITIES COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Meat Industry N=54	Frequency 1	2	3	4	Mean Rating
1	3	Demonstrate the ability to follow directions of supervisor.		1	16	37	3.667
2	2	Demonstrate a willingness to learn or take supervision.		1	18	35	3.630
3	1	Demonstrate a willingness to work.			21	33	3.611
4	6	Work safely and neatly.		1	23	30	3.537
5	8	Demonstrate a desirable job attitude about the organization when working with fellow employees, potential customers and customers.		1	23	30	3.537
6	7	Demonstrate the ability to work cooperatively as a member of a team.			27	27	3.500
7	12	Maintain a satisfactory attendance record.			27	27	3.500
8	5	Demonstrate the ability to get along with others.		3	24	27	3.444
9	9	Demonstrate acceptable personal appearance and personal hygiene.		5	21	28	3.426

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TABLE 24 - Continued

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Meat Industry N-54	Frequency 1	2	3	4	Mean Rating
10	4	Demonstrate the ability to work independently.		4	29	21	3.315
11	10	Demonstrate the ability to project a desirable image for firm.		4	29	21	3.315
12	11	Accept routine tasks without becoming disinterested.		2	33	19	3.315

Supervisor Competencies

The responses of fifteen supervisors to previously validated competencies appear in Table 25. The cluster of competencies in the top 25 percent are: Have knowledge of plant production processes; Consult with executives; Supervise work of others; Oversee sanitation and quality standards; Plan, develop and improve production procedures; Know plant machinery; Order and control the flow of materials to plant and Estimate price based on market reports, grades, transportation supplies, etc.

Knowledge and skills ranking among the lowest 25 percent and ranging between 1.5 and 2.7 were: Employing, training, supervising and discharging people; Analyzing economic trends; Determining price; Modifying machines and equipment and Keeping various records.

The two lowest rated competencies had a mean rating between 1.5 and 1.7. They were being able to read a flour analysis chart provided by the mill and Being licensed to operate a boiler.

TABLE 25

SUPERVISOR COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=15	Frequency 1	2	3	4	Mean Rating
1	20	Have a knowledge of all production processes.		2	5	8	3.400
2	24	Consult with company executives.	2		4	9	3.333
3	39	Supervise and coordinate activities of workers engaged in production, manufacturing and processing of products.	1	1	6	7	3.267
4	31	Oversee sanitation standards.	2	1	4	8	3.200
5	42	Direct activities of subordinate employees.	1		9	5	3.200
6	21	Coordinate all activities of production.		2	9	4	3.133
7	22	Be familiar with plant lay-out.	2	2	4	7	3.067
8	26	Plan and develop production procedures.	1	2	7	5	3.067
9	27	Originate and assess measures to designate or improve production methods, equipment performance and product quality.	2		8	5	3.067

TABLE 25 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=15	Frequency 1	2	3	4	Mean Rating
10	30	Be knowledgeable about all machinery used in the plant.	2	1	6	6	3.067
11	37	Direct quality control.	2	1	6	6	3.067
12	43	Handle workers' grievances.	1	1	9	4	3.067
13	54	Compute quantities of materials to be used.	2		8	5	3.067
14	55	Requisition supplies.	2		8	5	3.067
15	59	Estimate price based on market reports, grades, transportation, supplies, etc.	2	2	4	7	3.067
16	61	Identify the purchasing needs for the business.	2		8	5	3.067
17	63	Reject sub-standard goods and services.	2		8	5	3.067
18	64	Purchase goods or services.	2		8	5	3.067
19	36	Oversee the maintenance of plant equipment.	2	1	7	5	3.000
20	44	Recommend changes in working conditions.	2	2	5	6	3.000
21	47	Project manpower requirements.	2	2	5	6	3.000

TABLE 25 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=15	Frequency 1	2	3	4	Mean Rating
22	56	Understand marketing, contract and credit conditions.	2	2	5	6	3.000
23	58	Be able to use basic mathematics.	2	1	7	5	3.000
24	28	Be aware of raw material sources and supply.	3	1	5	6	2.933
25	33	Prepare time and cost estimates.	2	2	6	5	2.933
26	41	Instruct employees in the fullfillment of their duties.	2	1	8	4	2.933
27	49	Understand union policy.	2	2	6	5	2.933
28	53	Be aware of marketing and distribution problems.	2	2	6	5	2.933
29	57	Have technical knowledge of the materials or products in the products being produced.	2	1	8	4	2.933
30	25	Confer with department heads to formulate programs regarding availability of raw materials.	3	1	6	5	2.867
31	45	Interpret company policy and production procedures to subordinates.	3	1	6	5	2.867
32	23	Be familiar with production capacities of each department.	3	2	5	5	2.800

TABLE 25 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=15	Frequency 1	2	3	4	Mean Rating
33	46	Plan surveys to determine effectiveness of manpower utilization.	2	3	6	4	2.800
34	62	Spell out specifications of acceptability for raw materials.	2	2	8	3	2.800
35	65	Arrange for delivery and different modes of transportation.	3	1	7	4	2.800
36	48	Hire and fire employees.	4	1	5	5	2.733
37	52	Analyze economic trends.	3	2	6	4	2.733
38	34	Write to supervisors, reports of production figures and completion dates.	2	4	6	3	2.667
39	40	Train new employees.	3	2	7	3	2.667
40	51	Determine sales forecasts.	4	1	6	4	2.667
41	60	Determine prices of products produced in accordance with state laws.	4	2	4	5	2.667
42	38	Make modifications in machines and equipment.	4	3	3	5	2.600
43	35	Prepare production and labor records.	5		7	3	2.533

TABLE 25 - Continued

Rank Order No.	Comp. No.	Supervisor Competencies as Rated by Supervisors and Others N=15	Frequency 1	2	3	4	Mean Rating
44	50	Supervise apprenticeship or training programs.	5		8	2	2.467
45	32	Read flour analysis chart provided by mill.	9	2	3	1	1.733
46	29	Be licensed to operate a boiler.	10	2	3		1.533

Butcher

Competencies validated as being important to the job title Butcher were rated by twenty-three persons. Mean ratings given these competencies appear in Table 26. Being familiar with sanitary procedures; Using and maintaining a knife skillfully; Maintaining condition of meats; Cleanliness and Being able to sever jugular vein and skin animals were competencies rated among the top 25 percent.

Knowledge and skills ranking in the bottom 25 percent were those associated with: Recognizing abnormalities of offal or carcass; Reducing carcass to retail cuts; Shakling legs; Receiving meats from packer or supplier; Transporting meat to storage room; Antemortem procedures; Unloading live animals and Wrapping dressed carcasses.

All thirty-four competencies for the job title Butcher had a mean rating of over 2, indicating they were of "Some Importance" in this job title.

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TABLE 26

BUTCHER COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Butcher Competencies as Rated by Butchers and Others N=23	Frequency 1	2	3	4	Mean Rating
1	570	Be acquainted with all sanitary procedures.	3	2	9	9	3.043
2	552	Use a knife skillfully.	4	3	5	11	3.000
3	576	Rotate stored meats to avoid over-aging and spoilage.	4	1	9	9	3.000
4	553	Have the ability to adequately steel or hone a knife to sharpen.	5	2	5	11	2.957
5	578	Clean storage area.	3	3	9	8	2.957
6	556	Sever jugular vein to drain blood.	5	2	7	9	2.870
7	557	Skin animals.	4	3	8	8	2.870
8	579	Have knowledge of temperature control regulations for processing of meat.	4	4	7	8	2.826
9	582	Be familiar with standard meat cuts.	4	2	11	6	2.826
10	558	Eviscerate animal.	3	6	7	7	2.783

TABLE 26 - Continued

Rank Order No.	Comp. No.	Butcher Competencies as Rated by Butchers and Others N=23	Frequency 1	2	3	4	Mean Rating
11	564	Trim, skin and separate edible portions from offal.	4	4	8	7	2.783
12	572	Store meats under approved conditions.	4	4	8	7	2.783
13	581	Bone and trim cuts of meat.	5	2	9	7	2.783
14	555	Stun animals prior to slaughtering using a stunning gun.	5	3	8	7	2.739
15	575	Count and weigh incoming articles and compare against invoice.	4	4	9	6	2.739
16	561	Split open carcass.	5	5	5	8	2.696
17	569	Use power equipment (grinder, cubing machine, power saw).	5	2	11	5	2.696
18	562	Wash carcass for final inspection.	4	7	5	7	2.652
19	567	Report abnormalities of offal on carcass to supervisor.	3	6	10	4	2.652
20	550	Have a basic knowledge of meats.	4	6	8	5	2.609
21	551	Be familiar with animal anatomy.	5	4	9	5	2.609

TABLE 26 - Continued

Rank Order No.	Comp. No.	Butcher Competencies as Rated by Butchers and Others N=23	Frequency 1	2	3	4	Mean Rating
22	568	Use hand cutting tools (knife, cleaver, saw, etc.).	5	5	7	6	2.609
23	580	Reduce carcass to primal pieces.	6	1	12	4	2.609
24	560	Trim out carcass.	4	9	3	7	2.565
25	563	Shroud carcass.	5	6	7	5	2.522
26	565	Trim head meat and other parts of animals' heads or skulls.	5	5	9	4	2.522
27	566	Recognize abnormalities of offal on carcass.	5	6	9	3	2.435
28	583	Reduce carcass to retail cuts.	7	4	7	5	2.435
29	559	Shakle hind legs.	5	11	2	5	2.304
30	571	Receive meats from packer or supplier.	6	7	7	3	2.304
31	574	Transport to storage room on rails using trolleys and hoists.	6	8	5	4	2.304
32	554	Be familiar with antemortem procedures.	5	10	6	2	2.217
33	573	Unload live animals from stock truck.	6	10	3	4	2.217
34	577	Wrap muslin cloth about dressed carcasses to improve appearance of carcass.	9	7	5	2	2.000

Sausage Maker

The data in Table 27 ranks the mean ratings of competencies for the job title Sausage Maker.

Being able to follow a recipe; Weighing and measuring ingredients; Making jerky, salami, sausage, etc.; Filling casings and Tending mixing machines were those competencies rated in the top 25 percent and whose mean ratings was 3.4.

Competencies ranking in the bottom 25 percent were those associated with: The operation of griding, mixing, blending machines and their lubrication and repair.

TABLE 27

SAUSAGE MAKER COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Sausage Maker Competencies as Rated by Sausage Makers and Others N=7	Frequency 1	2	3	4	Mean Rating
1	620	Follow a recipe or formula.		1	1	5	3.429
2	621	Weigh and measure ingredients.		1	1	5	3.429
3	622	Combine ingredients to make jerkey, salami, sausage, etc.		1	1	5	3.429
4	631	Fill casings.		1	1	5	3.429
5	615	Tend machine to mix ingredients such as ground meat and seasonings to make sausage according to formula.		1	2	4	3.286
6	616	Determine proper time periods for curing fresh meat.		1	2	4	3.286
7	617	Smoke and cure meat.		1	2	4	3.286
8	618	Read gauges for temperature and moisture control.		1	3	3	3.143
9	619	Regulate gauges.		1	3	3	3.143

TABLE 27 - Continued

Rank Order No.	Comp. No.	Sausage Maker Competencies as Rated by Sausage Makers and Others N=7	Frequency 1	2	3	4	Mean Rating
10	623	Place ingredients in mixing machine.	1		3	3	3.143
11	629	Empty ingredients into a container.	1		3	3	3.143
12	630	Be able to determine meat textures for making salami and weiners.	1	1	1	4	3.143
13	628	Grind meat.	1		4	2	3.000
14	632	Have knowledge of ingredient labeling according to federal regulations.	1		4	2	3.000
15	624	Start machine.	1	1	3	2	2.857
16	625	Operate grinder.	1	1	3	2	2.857
17	626	Operate mixer.	1	1	3	2	2.857
18	627	Operate silent cutter (blender).	2	1	1	3	2.714
19	633	Lubricate machines.	2	2	2	1	2.286
20	634	Repair machines.	4	2	1		1.571

Shipping Clerk

Eight employees in the job title Shipping Clerk were interviewed. The results appear in Table 28.

Competencies ranking in the top 25 percent were: Being able to prepare bills of lading; Counting and preparing orders and Weighing and preparing containers for shipping.

The shipping clerk, in addition to performing clerical functions routine to most offices, performs fairly strenuous physical activities.

Even though the competencies for this job title were validated, all received a relatively low importance rating. The highest rating was 2.7 which indicates that its importance is between being of "Some Importance" and being "Important".

TABLE 28

SHIPPING CLERK COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Shipping Clerk Competencies as Rated by Shipping Clerks and Others N=8	Frequency 1	2	3	4	Mean Rating
1	162	Attach postage or bill of lading.	2	1	2	3	2.750
2	151	Count and compare quantity and identification number of units against order.	2	1	3	2	2.625
3	159	Stamp, stencil or glue identifying information and shipping instruction on containers.	3		2	3	2.625
4	161	Weigh containers.	3		2	3	2.625
5	150	Prepare products for shipment.	2	1	5		2.375
6	152	Put up salesman's orders.	4		2	2	2.250
7	155	Insert items into containers using spacers, fillers, and protective padding.	3	2	2	1	2.125
8	160	Move containers to shipping dock by handtruck, fork lift or overhead hoists.	3	2	3		2.000
9	153	Assemble wooden or cardboard containers.	3	3	2		1.875

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TABLE 28 - Continued

Rank Order No.	Comp. No.	Shipping Clerk Competencies as Rated by Shipping Clerks and Others N=8	Frequency 1	2	3	4	Mean Rating
10	154	Select pre-assembled containers.	3	3	2		1.875
11	157	Operate strapping machine.	3	4	1		1.750
12	158	Bind containers with metal tape by hand or machine.	4	2	2		1.750
13	156	Nail covers on wooden crates.	5	3			1.375

Meat Cutter

Ratings of competencies for the job title Meat Cutter are shown in Table 29. Competencies with mean ratings in the top 25 percent were: Using and conditioning a knife skillfully; Being acquainted with sanitary procedures; Cleaning grinders and containers; Rotating stored meats to avoid overaging; Reducing carcass to retail cuts and Controlling regulations for processing of meat. All of the above had a mean rating of 3 or above, indicating they were important competencies.

Knowledge and skills rating in the bottom 25 percent were: Familiarity with anatomy of animal; Collect money from sale of meat; Arrange trays for display; Transport meat to storage; Unload live animals from truck; Wrap carcass with muslin and Clean and cut fish and poultry.

TABLE 29

MEAT CUTTER COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Meat Cutter Competencies as Rated by Meat Cutters and Others N=38	Frequency 1	2	3	4	Mean Rating
1	587	Use a knife skillfully.	5	3	13	17	3.105
2	589	Be acquainted with all sanitary procedures.	4	6	11	17	3.079
3	612	Clean grinders, meat containers.	4	6	12	16	3.053
4	588	Have the ability to adequately steel or hone a knife to sharpen.	5	4	14	15	3.026
5	595	Rotate stored meats to avoid over-aging and spoilage.	7		16	15	3.026
6	602	Reduce carcass to retail cuts.	6	3	13	16	3.026
7	598	Have knowledge of temperature control regulations for processing of meat.	6	6	8	18	3.000
8	600	Bone and trim cuts of meat.	6	2	16	14	3.000
9	597	Clean storage area.	5	4	16	13	2.974
10	591	Store meats under approved conditions.	5	3	19	11	2.947

TABLE 29 - Continued

Rank Order No.	Comp. No.	Meat Cutter Competencies as Rated by Meat Cutters and Others N=38	Frequency 1	2	3	4	Mean Rating
11	601	Be familiar with standard meat cuts.	7	3	13	15	2.947
12	604	Cut and trim meat as ordered by customer.	6	3	17	12	2.921
13	585	Have a basic knowledge of meats.	5	8	11	14	2.895
14	610	Weigh meat.	5	7	14	12	2.868
15	599	Reduce carcass to primal pieces.	8	3	15	12	2.816
16	603	Cut and trim meat to size for display.	10	2	12	14	2.789
17	594	Count and weigh incoming articles and compare against invoice.	8	6	11	13	2.763
18	590	Receive meats from packer or supplier.	5	9	15	9	2.737
19	608	Wrap meats for freezer.	9	5	14	10	2.658
20	606	Place meat in containers.	7	10	12	9	2.605
21	607	Package meats for display purposes.	11	5	11	11	2.579
22	586	Be familiar with animal anatomy.	10	9	10	9	2.474
23	611	Collect money from sale of meat.	14	5	6	13	2.474

TABLE 29 - Continued

Rank Order No.	Comp. No.	Meat Cutter Competencies as Rated by Meat Cutters and Others N=38	Frequency 1	2	3	4	Mean Rating
24	609	Arrange meat on trays for display counters.	11	8	10	9	2.447
25	593	Transport to storage room on rails using trolleys and hoists.	12	11	10	5	2.211
26	592	Unload live animals from stock truck.	18	10	5	5	1.921
27	596	Wrap muslin cloth about dressed carcasses to improve appearance of carcass.	18	9	7	4	1.921
28	605	Clean and cut fish and poultry.	22	6	4	6	1.842

Render Operator

The job title Render Operator needs the knowledge and skills essential to the job of disposing of animal waste products. A rank ordering of these competencies appears in Table 30.

The top 25 percent of the competencies were: Being able to load and operate a cooker; Read moisture meter and Determine when process is complete.

Those ranking in the bottom 25 percent and having a mean rating of 2.4 were: Using press for tallow extraction; Opening washer and hasher; Conveying meat and tallow to storage tanks or bins.

TABLE 30

RENDER OPERATOR COMPETENCIES IN THE MEAT INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Render Operator Competencies as Rated by Render Operators and Others N=7	Frequency 1	2	3	4	Mean Rating
1	661	Load cooker.	2		1	4	3.000
2	643	Operate cooker.	2		1	4	3.000
3	644	Read moisture meter.	2		1	4	3.000
4	647	Be able to determine when process is completed.	2		1	4	3.000
5	640	Select waste products from slaughtering operation.	2	1		4	2.857
6	645	Separate meat from tallow.	2		2	3	2.857
7	648	Operate grinder to grind meal.	2		2	3	2.857
8	641	Operate pre-breaker for condemned carcasses.	3			4	2.714
9	646	Use press to further extract tallow.	3		2	2	2.429
10	649	Operate hasher and washer.	3		2	2	2.429
11	650	Store tallow in tank.	3		2	2	2.429
12	651	Convey meat to storage bins.	3		2	2	2.429

Flour Milling Industry:

Montana has three flour mills and all were surveyed. The employer again indicated that there is difficulty in hiringhighly skilled persons and that there are vacancies that were not filled because of the lack of trained personnel. Because of the small number of persons responding, the data is not as reliable as it could be, but it does present a review of job duties in thisindustry. Tables 31 through 37 show competencies in the flour milling industry rank ordered by mean.

Personal Qualities

Employees' ratings of Personal Qualities competencies are shown in Table 31. Thirteen employees in five job titles rated these competencies. The mean ratings of the top 25 percent of the competencies ranged between 3.4 and 3.5.

These competencies were: To be able to take supervision; Willingness to work; Work safely, neatly and independently.

Competencies ranking in the bottom 25 percent were: Personal appearance and hygiene; Project desirable firm image and Accept routine tasks. The mean ratings indicated that these were either "Important" or "Essential" competencies.

TABLE 31

PERSONAL QUALITIES COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Flour Milling Industry N=13	Frequency 1	2	3	4	Mean Rating
1	2	Demonstrate a willingness to learn or take supervision.			6	7	3.538
2	1	Demonstrate a willingness to work.			7	6	3.462
3	4	Demonstrate the ability to work independently.			7	6	3.462
4	6	Work safely and neatly.			7	6	3.462
5	5	Demonstrate the ability to get along with others.			8	5	3.385
6	12	Maintain a satisfactory attendance record.		1	6	6	3.385
7	3	Demonstrate the ability to follow directions of supervisor.		1	7	5	3.308
8	8	Demonstrate a desirable job attitude about the organization when working with fellow employees, potential customers and customers.		2	5	6	3.308
9	7	Demonstrate the ability to work cooperatively as a member of a team.		2	6	5	3.231

TABLE 31 - Continued

Rank Order No.	Comp. No.	Personal Qualities Competencies as Rated by Employees in the Flour Milling Industry N=13	Frequency 1	2	3	4	Mean Rating
10	9	Demonstrate acceptable personal appearance and personal hygiene.	1	2	5	5	3.077
11	10	Demonstrate the ability to project a desirable image for firm.	1	2	7	3	2.923
12	11	Accept routine tasks without becoming disinterested.		4	7	2	2.846

Crop Production

In order to determine what milling employees needed to know about Crop Production, employees in the several milling industry job titles reacted to eleven Crop Production competencies. The results appear in Table 32. Four competencies ranked in the top 25 percent. These were: Determining moisture of grain; Recognizing crop hazards; Recognizing safety precautions relating to handling agricultural chemicals and Cleaning grain storage procedures.

Competencies with mean ratings between 1.2 and 1.4 and of some or no importance were: Selecting sprays or dusts for cropping practices; Knowing stages and growth development of crops and Advising customers about fertilizers and chemicals.

TABLE 32

CROP PRODUCTION COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Crop Production Competencies as Rated by Employees in the Flour Milling Industry N=13	Frequency 1	2	3	4	Mean Rating
1	709	Determine moisture content of grain.	2	2	5	4	2.846
2	705	Recognize and identify actual and potential crop hazards such as disease, weeds and insects.	4	2	4	3	2.462
3	702	Observe recommended safety precautions in handling agricultural chemicals.	5	1	4	3	2.385
4	708	Know the proper storage procedures for grain.	2	5	5	1	2.385
5	704	Interpret the directions for the proper application of agri-chemicals.	7	2	3	1	1.846
6	707	Determine when crops are ready to harvest.	5	5	3		1.846
7	700	Know the acceptable crop production techniques essential to the production of quality crops.	6	5	2		1.692
8	706	Know where and how to obtain advanced information about improved crop production techniques.	6	6	1		1.615

TABLE 32 - Continued

Rank Order No.	Comp. No.	Crop Production Competencies as Rated by Employees in the Flour Milling Industry N=13	Frequency 1	2	3	4	Mean Rating
9	701	Select sprays and dusts for the appropriate cropping practice.	9	3	1		1.385
10	703	Know stages and growth development of crop maturation.	9	4			1.308
11	710	Advise customers as to fertilizers and chemicals.	11	2			1.154

Remaining Flour Milling Competencies

Tables 33, 34, 35, 36, and 37 present competency data for the job titles of Milling Superintendent, Flour Packer, Chemist, Miller and Smutter. There are no Tables for Warehouseman and Buhr-miller since only one person in each title reacted to the respective competency statements.

Because of the small numbers of persons responding to these competencies, the tables are not accompanied by an explanation. It was felt by the researcher that with two to three persons rating the competency the results were not as meaningful. Since only three flour mills exist in Montana, these competencies would need to be validated among persons in similar job titles within several states in the Pacific Northwest since any training program would, by necessity, be a regional effort.

TABLE 33

MILLING SUPERINTENDENT COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Milling Superintendent Competencies as Rated by Milling Superintendents and Others N=3	Frequency 1	2	3	4	Mean Rating
1	26	Plan and develop production procedures.			1	2	3.667
2	39	Supervise and coordinate activities of workers engaged in production, manufacturing and processing of products.			1	2	3.667
3	40	Train new employees.			1	2	3.667
4	47	Project manpower requirements.			1	2	3.667
5	58	Be able to use basic mathematics.			1	2	3.667
6	20	Have a knowledge of all production processes.		1		2	3.333
7	24	Consult with company executives.			2	1	3.333
8	27	Originate and assess measures to designate or improve production methods, equipment performance and product quality.			2	1	3.333
9	36	Oversee the maintenance of plant equipment.			2	1	3.333
10	41	Instruct employees in the fullfillment of their duties.			2	1	3.333

TABLE 33 - Continued

Rank Order No.	Comp. No.	Milling Superintendent Competencies as Rated by Milling Superintendents and Others N=3	Frequency 1	2	3	4	Mean Rating
11	42	Direct activities of subordinate employees.			2	1	3.333
12	43	Handle workers grievances.			2	1	3.333
13	45	Interpret company policy and production procedures to subordinates.			2	1	3.333
14	48	Hire and fire employees.			2	1	3.333
15	57	Have technical knowledge of the materials or products in the products being produced.		1		2	3.333
16	21	Coordinate all activities of production.		1	1	1	3.000
17	31	Oversee sanitation standards.	1			2	3.000
18	32	Read flour analysis chart provided by mill.	1			2	3.000
19	34	Write to supervisors, reports of production figures and completion dates.			3		3.000
20	38	Make modifications in machines and equipment.			3		3.000
21	44	Recommend changes in working conditions.			3		3.000
22	46	Plan surveys to determine effectiveness of manpower utilization.		1	1	1	3.000

TABLE 33 - Continued

Rank Order No.	Comp. No.	Milling Superintendent Competencies as Rated by Milling Superintendents and Others N=3	Frequency 1	2	3	4	Mean Rating
23	49	Understand union policy.			3		3.000
24	50	Supervise apprenticeship or training programs.			3		3.000
25	54	Compute quantities of materials to be used.		1	1	1	3.000
26	22	Be familiar with plant lay-out.	1		1	1	2.667
27	23	Be familiar with production capacities of each department.	1		1	1	2.667
28	30	Be knowledgeable about all machinery used in the plant.	1		1	1	2.667
29	53	Be aware of marketing and distribution problems.		1	2		2.667
30	55	Requisition supplies.	1		1	1	2.667
31	25	Confer with department heads to formulate programs regarding availability of raw materials.	1	1		1	2.333
32	28	Be aware of raw material sources and supply.	1		2		2.333
33	33	Prepare time and cost estimates.	1		2		2.333
34	35	Prepare production and labor records.		2	1		2.333

TABLE 33 - Continued

Rank Order No.	Comp. No.	Milling Superintendent Competencies as Rated by Milling Superintendents and Others N=3	Frequency 1	2	3	4	Mean Rating
35	61	Identify the purchasing needs for the business.		2	1		2.333
36	63	Reject sub-standard goods and services.	1	1		1	2.333
37	29	Be licensed to operate a boiler.	2			1	2.000
38	62	Spell out specifications of acceptability for raw materials.	2			1	2.000
39	64	Purchase goods or services.	1	1	1		2.000
40	37	Direct quality control.	1	2			1.667
41	65	Arrange for delivery and different modes of transportation.	1	2			1.667
42	52	Analyze economic trends.	2	1			1.333
43	56	Understand marketing, contract and credit conditions.	2	1			1.333
44	59	Estimate price based on market reports, grades, transportation, supplies, etc.	2	1			1.333
45	51	Determine sales forecasts.	3				1.000
46	60	Determine prices of products produced in accordance with state laws.	3				1.000

TABLE 34

FLOUR PACKER COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Flour Packer Competencies as Rated by Flour Packers and Others N=3	Frequency 1	2	3	4	Mean Rating
1	71	Accept routine tasks without becoming disinterested.		1	1	1	3.000
2	73	Maintain Union membership.	1			2	3.000
3	77	Have a basic mechanical ability.		1	1	1	3.000
4	78	Start machines.	1			2	3.000
5	80	Stop machines.	1			2	3.000
6	93	Replenish packaging supplies (wrapping paper, plastic sheeting, boxes, cartons, bags, etc.).	1			2	3.000
7	94	Feed products onto conveyors, hoppers.	1			2	3.000
8	95	Clear away damaged products or containers.	1			2	3.000
9	96	Inspect filled container to insure packaging according to specifications.	1			2	3.000
10	97	Check to insure finished quality product (proper closing, appearance of carton).	1			2	3.000

TABLE 34 - Continued

Rank Order No.	Comp. No.	Flour Packer Competencies as Rated by Flour Packers and Others N=3	Frequency 1	2	3	4	Mean Rating
11	98	Visually inspect materials, products and containers at each step of the packaging process.	1			2	3.000
12	70	Be aware of all sanitary procedures.	1		1	1	2.667
13	74	Convey materials and items from receiving or production areas to storage by hand or using machinery.	1		1	1	2.667
14	75	Place materials or products on conveyors, pallets or plastic trays.	1		1	1	2.667
15	81	Report malfunctions of machinery to supervisor.	1		1	1	2.667
16	91	Feed carton into machine and remove them from discharge conveyor.	1		1	1	2.667
17	92	Position and hold container in machine.	1		1	1	2.667
18	101	Record weight, size and type of products packaged.	1		1	1	2.667
19	79	Observe operation and detect malfunction.	1	1		1	2.333
20	86	Adjust conveyors or control valves, spouts, etc. to regulate flow of product.	1	1		1	2.333

TABLE 34 - Continued

Rank Order No.	Comp. No.	Flour Packer Competencies as Rated by Flour Packers and Others N=3	Frequency 1	2	3	4	Mean Rating
21	90	Lubricate equipment.	1	1		1	2.333
22	102	Keep machine yield records.	1	1		1	2.333
23	72	Tend machine that performs one or more packaging functions (filling, marking, weighing, wrapping, closing, etc.).	2			1	2.000
24	85	Weight containers and adjust quantity.	2			1	2.000
25	99	Unload packaged product.	2			1	2.000
26	100	Label ingredients according to federal regulations.	2			1	2.000
27	76	Directly place materials or products on trucks using either hands, hoists, or winches.	2		1		1.667
28	82	Make minor adjustments to machinery.	2		1		1.667
29	88	Set guides.	2		1		1.667
30	104	Keep records of materials or items received or distributed.	2		1		1.667
31	89	Adjust tension on drive belts, conveyors or chains.	2	1			1.333

TABLE 34 - Continued

Rank Order No.	Comp. No.	Flour Packer Competencies as Rated by Flour Packers and Others N=3	Frequency 1	2	3	4	Mean Rating
32	83	Repair machinery.	3				1.000
33	84	Open valves.	3				1.000
34	87	Change forming and cutting dies.	3				1.000
35	103	Keep and compile stock records.	3				1.000

TABLE 35

CHEMIST COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Chemist Competencies as Rated by Chemists and Others N=3	Frequency 1	2	3	4	Mean Rating
1	733	Adjust balances to weigh materials.		1		2	3.333
2	725	Keep accurate records of laboratory experiments.		1	1	1	3.000
3	721	Observe all safety procedures.		2		1	2.667
4	722	Observe all sanitary procedures.		2		1	2.667
5	716	Conduct tests and experiments with various additives.	1	1		1	2.333
6	723	Have a basic mechanical ability.	1		2		2.333
7	730	Operate a digester to perform protein tests.	1	1		1	2.333
8	715	Conduct tests and experiments with wheat and flour.	2			1	2.000
9	717	Conduct tests and experiments with cereal by-products.	2			1	2.000
10	718	Test to determine that quality standards are met.	2			1	2.000

TABLE 35 - Continued

Rank Order No.	Comp. No.	Chemist Competencies as Rated by Chemists and Others N=3	Frequency 1	2	3	4	Mean Rating
11	719	Test to determine that purity standards are met.	2			1	2.000
12	720	Test products to insure compliance with food and drug laws.	2			1	2.000
13	724	Provide a flour analysis statement for customers.	2			1	2.000
14	726	Supervise subordinates activities.	2			1	2.000
15	727	Operate a muffle oven to determine ash content.	2			1	2.000
16	728	Operate an amylograph to determine malt content.	2			1	2.000
17	729	Operate a farinagraph to determine dough quality.	2			1	2.000
18	731	Operate a roto-top for testing granulation of whole wheat flour.	2			1	2.000
19	732	Operate a moisture tester to determine moisture of material.	2			1	2.000
20	734	Operate distillation units.	2			1	2.000
21	735	Operate an electro-photometer to test for color and additives.	2		1		1.667

TABLE 36

MILLER COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Miller Competencies as Rated by Millers and Others N=2	Frequency 1	2	3	4	Mean Rating
1	741	Tend machines that mix, grind, or pulverize materials used in making flour.			1	1	3.500
2	742	Know the system by which the product flows through the mill.			1	1	3.500
3	743	Know the several processes in starting the mill.			1	1	3.500
4	744	Start and stop conveyors.			1	1	3.500
5	746	Stop conveyor and remove clogged material.			1	1	3.500
6	748	Open chute or conveyor to add materials.			1	1	3.500
7	750	Operate a bank of roll grinders to grind grain into flour.			1	1	3.500
8	751	Turn wheels to adjust pressure of grinding rollers for each break (passage of grain between rollers) according to grain size and hardness.			1	1	3.500
9	752	Adjust rollers to maintain maximum yield from grain being ground.			1	1	3.500

TABLE 36 - Continued

Rank Order No.	Comp. No.	Miller Competencies as Rated by Millers and Others N=2	Frequency 1	2	3	4	Mean Rating
10	753	Adjust grinding rollers and other equipment to mill product to specifications.			1	1	3.500
11	756	Add moisture to materials to facilitate flow into machines.			1	1	3.500
12	758	Detect by feel, the quality of flour being produced.			1	1	3.500
13	759	Observe all plant safety procedures.			1	1	3.500
14	745	Observe conveyor system to insure continuous flow of material.			2		3.000
15	747	Re-route mill flow in the event of break-down or blockage.			2		3.000
16	749	Observe the operation of auxillary equipment.			2		3.000
17	754	Turn valves to regulate flow of air, water or oil to meet laboratory specifications.			2		3.000
18	755	Regulate feeder mechanism of machines not equipped with automatic regulators.			2		3.000
19	757	Operate machinery essential in the flour sifting process.			2		3.000

TABLE 36 - Continued

Rank Order No.	Comp. No.	Miller Competencies as Rated by Millers and Others N=2	Frequency 1	2	3	4	Mean Rating
20	760	Observe all plant sanitary procedures.			2		3.000
21	761	Possess a basic mechanical ability.			2		3.000
22	740	Have a basic knowledge of the milling process.		1	1		2.500
23	762	Supervise subordinates.		1	1		2.500
24	763	Keep production and storage records.	1	1			1.500

TABLE 37

SMUTTER COMPETENCIES IN THE FLOUR MILLING INDUSTRY
RANK ORDERED BY MEAN

Rank Order No.	Comp. No.	Smutter Competencies as Rated by Smutters and Others N=2	Frequency 1	2	3	4	Mean Rating
1	803	Have a basic mechanical ability.		1		1	3.000
2	780	Clean and temper grain prior to grinding.	1			1	2.500
3	782	Adjust slides in bin spouts.	1			1	2.500
4	783	Open and close slides in spouts to route grain to various grinders and sifters.	1			1	2.500
5	784	Start elevator to route grain from storage bins to machines.	1			1	2.500
6	785	Adjust valves to regulate water temperature and level in washer.	1			1	2.500
7	786	Adjust valves to adjust air suction to remove dust from separators.	1			1	2.500
8	788	Turn wingnuts to adjust angle of separator screens according to grain flow and amount of refuse.	1			1	2.500

TABLE 37 - Continued

Rank Order No.	Comp. No.	Smutter Competencies as Rated by Smutters and Others N=2	Frequency 1	2	3	4	Mean Rating
9	789	Hook bag under end of screen to catch refuse.	1			1	2.500
10	790	Start machine to process grain.	1			1	2.500
11	791	Observe flow entering machines to prevent over-loading.	1			1	2.500
12	792	Adjust feed chutes to regulate flow of grain to rollers.	1			1	2.500
13	793	Examine processed grain to determine cleanliness.	1			1	2.500
14	794	Dislodge clogged grain.	1			1	2.500
15	795	Tend separating equipment.	1			1	2.500
16	796	Detect when grinding rollers need to be replaced.	1			1	2.500
17	798	Regulate the supply of wheat in keeping with the various component demands of the mill.	1			1	2.500
18	799	Be aware of various storage bin capacities.	1			1	2.500
19	800	Supervise activites of subordinates.	1			1	2.500
20	801	Observe all plant safety procedures.	1			1	2.500

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TABLE 37 - Continued

Rank Order No.	Comp. No.	Smutter Competencies as Rated by Smutters and Others N=2	Frequency 1	2	3	4	Mean Rating
21	802	Observe all plant sanitary procedures.	1			1	2.500
22	804	Keep legible, accurate records.	1			1	2.500
23	781	Tend grain separating, washing and scouring machines to remove dirt, smut and rust from grain before milling.	2				1.000
24	787	Adjust valves to regulate flow of air through drier.	2				1.000
25	797	Replace worn grinding rollers with hand tools.	2				1.000

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Personal Qualities Competencies

The Personal Qualities competencies appear in Table 38 and are rank ordered by probability value. Competencies having a probability value of .05 or less were considered to be "Not Similar". Competencies having a higher probability value were considered to be "Similar".

When discussing the particular competencies for each industry, three levels of similarity in the competencies were discussed. For consistency in reporting, probability values were categorized. The top 25 percent are "Very Similar". Probability values between the top 25 percent and those with a probability value over .05 are called "Similar".

In order to determine whether or not these employees rated personal quality differently, the researcher tested each of the common competencies against each industry where there were similarities in job functions.

As indicated when discussing methodology page 10, this procedure was used as a guideline for determining differences; the statistical assumptions underlying the use of the Chi Square test, relating to cells containing "0" values and values less than "5" were known to be invalid.

The personal qualities competency instrument was completed by all employees. Each personal quality competency was tested across the four industries investigated. The results appear in Table 38. While nine competencies appeared to be either "Very Similar" or "Similar", three were "Not Similar".

TABLE 38

EVALUATION OF PERSONAL QUALITIES COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
6.	Work safely and neatly	.7553	
5.	Get along with others	.6447	VERY SIMILAR
2.	Willingness to learn	.4370	
1.	Willingness to work	.2776	
4.	Work independently	.2696	
12.	Satisfactory attendance record	.2347	
3.	Follow directions of supervisor	.2054	SIMILAR
7.	Work cooperatively as a team member	.1478	
8.	Desirable job attitude	.1470	
9.	Acceptable personal appearance	.0485	
11.	Accept routine tasks	.0151	
10.	Project desirable image for firm	.0099	NOT SIMILAR

Acceptable personal appearance and hygiene, as the data points out in Table 39, is a competency perceived differently by the several businesses. While it was essential in all categories of employees in the several businesses there were apparently jobs in each industry where it was of only some importance. In the case of the milling business one employee rated the competency as not important.

TABLE 39

PERSONAL QUALITIES COMPETENCY NUMBER 8
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
8. Demonstrate acceptable personal appearance and personal hygiene.	BAKERY	0	0	13	17	.0485
	DAIRY	0	5	27	42	
	MEAT	0	5	21	28	
	MILL	1	2	5	5	

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As the data in Table 40 shows, accepting routine tasks was a competency rated differently by the several industries. It appeared to be "Essential" to the dairy industry. "Very Important" to the bakery and meat industry and of less importance to employees in the milling industry.

TABLE 40

PERSONAL QUALITIES COMPETENCY NUMBER 10
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
10. Demonstrate the ability to project a desirable image for firm.	BAKERY	0	2	15	13	.0099
	DAIRY	0	2	29	43	
	MEAT	0	4	29	21	
	MILL	1	2	7	3	

Data in Table 41 indicates that to be able to: Demonstrate the ability to project a desirable image for the firm is a competency "Important" to the bakery, meat and milling industries, but which is "Essential" to persons in the dairy industry. This might occur because persons in the dairy industry are required to be in contact frequently with the general public.

TABLE 41

PERSONAL QUALITIES COMPETENCY NUMBER 10
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
10. Demonstrate the ability to project a desirable image for firm.	BAKERY	0	2	15	13	.0099
	DAIRY	0	2	29	43	
	MEAT	0	4	29	21	
	MILL	1	2	7	3	

Supervisor competencies are ranked by probability value in Table 42. Forty-six competencies were ranked when compared against the four industries (i.e., dairy, meat, bakery and milling).

The top 25 percent, or 12 of the competencies, were "Very Similar", 31 competencies were "Similar" and 4 had probability values below .05 and were "Not Similar".

TABLE 42

EVALUATION OF SUPERVISOR COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
46.	Plan surveys	.9506	VERY SIMILAR
41.	Instruct employees	.9196	
39.	Supervise workers	.8818	
24.	Consult with executives	.8330	
33.	Prepare estimates	.8211	
42.	Direct subordinates' activities	.7796	
26.	Plan production procedures	.7300	
47.	Project manpower requirements	.7067	
30.	Know plant machinery	.6763	
31.	Oversee sanitation	.6570	
53.	Know marketing problems	.6290	
25.	Confer with department heads	.6070	
36.	Oversee maintenance	.5731	SIMILAR
20.	Know all production processes	.5552	
58.	Use basic math	.5545	
45.	Interpret company policy	.5504	
43.	Handle grievances	.4790	
27.	Improve production methods	.4630	
52.	Analyze economic trends	.3909	
22.	Know plant lay-out	.3691	

TABLE 42 - Continued

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
44.	Recommend changes	.3483	
49.	Understand Union policy	.3477	
48.	Hire and fire employees	.3446	
65.	Arrange for delivery	.3320	
57.	Have technical knowledge of materials	.3020	
59.	Estimate price	.2874	
38.	Modify machines	.2605	
23.	Know production capabilities	.2529	
55.	Requisition supplies	.2458	
28.	Know raw material sources	.2143	
54.	Compute quantities of materials	.2092	SIMILAR
34.	Write reports	.2047	
60.	Determine price	.1887	
40.	Train new employees	.1880	
51.	Determine sales forecasts	.1728	
21.	Coordinate production activities	.1009	
56.	Understand marketing, credit	.1008	
62.	Spell out raw materials specifications	.0893	
64.	Purchase goods	.0823	
50.	Supervise training program	.0585	
29.	Have license to operate boiler	.0564	
63.	Reject goods	.0538	

TABLE 42 - Continued

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
35.	Prepare records	.0480	
61.	Identify purchasing needs	.0416	
37.	Direct quality control	.0266	NOT SIMILAR
32.	Read flour analysis chart	.0135	

Supervisor Competencies

Preparing production and labor records in a competency perceived differently by the bakery, dairy, meat and milling industries, and is shown in Table 43. While it was "Essential" to "Important" for the supervisor in the bakery, dairy and meat industry to prepare production and labor records, it was only of some importance to the mill supervisor. Likewise, 5 of the 15 meat supervisors reported this competency to be of no importance.

TABLE 43

SUPERVISOR COMPETENCY NUMBER 35
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-Value
		1	2	3	4	
35. Prepare production and labor records.	BAKERY	0	1	6	3	.0480
	DAIRY	2	7	7	6	
	MEAT	5	0	7	3	
	MILL	0	2	1	0	

Supervisor Competencies

The data in Table 44 indicates that the following Supervisor competency, to be able to Identify the purchasing needs for the business, was not viewed similarly. While the bakery and dairy industries determine this competency to be "Essential", the meat and milling supervisors consider this competency table less important. It may be that persons other than the supervisor are charged with this responsibility in these two industries.

TABLE 44

SUPERVISOR COMPETENCY NUMBER 61
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
61. Identify the purchasing needs for the business.	BAKERY	0	0	4	6	.0416
	DAIRY	2	3	7	10	
	MEAT	2	0	8	5	
	MILL	0	2	1	0	

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Data in Table 45 shows that it is "Very Important" or "Essential" for Supervisors in the bakery and dairy industries to be able to Direct quality control. The same competency is of some importance to the meat industry and of little or no importance to the mill supervisor.

TABLE 45

SUPERVISOR COMPETENCY NUMBER 37
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
37. Direct quality control.	BAKERY	0	0	3	7	.0266
	DAIRY	1	2	8	11	
	MEAT	2	1	6	6	
	MILL	1	2	0	0	

The data in Table 46 is self-evident. The Supervisors in the bakery and the mill industry need to be competent in: Reading the flour analysis chart provided by the mill; on the other hand, the dairy and meat industry do not consider this competency to be important.

TABLE 46

SUPERVISOR COMPETENCY NUMBER 32
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
32. Read flour analysis chart provided by mill.	BAKERY	5	0	3	2	.0135
	DAIRY	20	1	0	1	
	MEAT	9	2	3	1	
	MILL	1	0	0	2	

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Persons employed as warehousemen and cooler men in the bakery and dairy were interviewed using a similar instrument. These data appear in Table 47. Nineteen competencies were tested for differences across the bakery and dairy industries. Only two competencies, Issue supplies and Convey materials, were considered to be "Not Similar" by the two industries.

TABLE 47

EVALUATION OF WAREHOUSEMAN/COOLER MAN COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
146.	Fill orders	.9215	
134.	Place materials on conveyor	.8358	
148.	Prepare inventories	.7412	VERY SIMILAR
139.	Determine storage methods	.7225	
144.	Wrap protective material	.6826	
141.	Store articles	.6669	
140.	Prepare shipping tags	.6308	
136.	Operate fork lift	.5730	
137.	Fill requisitions	.5619	
130.	Have strength requirements	.4690	
131.	Union membership	.4690	SIMILAR
142.	Rotation of stock	.3187	
145.	Keep records	.2884	
135.	Count, sort, weigh articles	.2685	
132.	Receive, store & issue equipment	.2439	
143.	Sort products	.2439	
138.	Examine stock	.2129	
147.	Issue supplies	.0290	NOT SIMILAR
133.	Convey materials	.0142	

The data in Table 48 shows that it was important for a Cooler Man in the dairy industry to issue supplies from stock while it was not very important for the bakery warehouseman.

TABLE 48

WARESHOUSEMAN/COOLER MAN COMPETENCY NUMBER 147
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
147. Issue supplies from stock.	BAKERY	1	1	0	0	.0290
	DAIRY	5	0	5	5	

The data in Table 49 shows that it is "Important" to "Essential" for the Cooler Man in the dairy to convey materials from receiving to storage and that it is not very important in the bakery business. Since bakery items are perishable items, they move from production and are transported directly to market rather than into storage.

TABLE 49

WAREHOUSEMAN/COOLER MAN COMPETENCY NUMBER 133
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
133. Convey materials and items from receiving or production areas to storage areas by hand or using machinery.	BAKERY	0	2	0	0	.0142
	DAIRY	1	1	7	6	

The thirty-five Machinery Operator competencies appear in three classifications based on their probability value in Table 50. Twenty-eight competencies were "Similar"; seven with a probability value less than .05 were considered to be "Not Similar". The Machinery Operator competencies were tested for their difference across the bakery, dairy and milling industries.

TABLE 50

EVALUATION OF MACHINERY OPERATOR COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
77.	Have basic mechanical ability	.9310	VERY SIMILAR
92.	Position container	.8274	
91.	Feed carton into machine	.8166	
74.	Convey materials	.8013	
94.	Feed products onto conveyors	.6076	
100.	Label ingredients	.4543	
81.	Report machinery malfunction	.3859	
75.	Place materials	.3582	
89.	Adjust belt tensions	.3558	
96.	Inspect containers	.3204	SIMILAR
93.	Replenish packaging supplies	.2918	
87.	Change dies	.2799	
73.	Maintain Union membership	.2566	
88.	Set guides	.2369	
97.	Insure quality product	.2141	
76.	Place products on trucks	.2122	
98.	Observe packaging steps	.1999	
78.	Start machines	.1930	
95.	Remove damaged goods	.1500	
80.	Stop machines	.1431	

TABLE 50 - Continued

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
79.	Observe machine operation	.1429	SIMILAR
101.	Record weight, etc.	.1418	
70.	Know sanitary procedures	.1227	
71.	Accept routine tasks	.1174	
90.	Lubricate equipment	.1102	
102.	Keep yield records	.1073	
85.	Weigh containers	.0616	
104.	Keep distribution records	.0591	
86.	Adjust conveyors	.0419	NOT SIMILAR
82.	Make minor adjustments	.0352	
83.	Repair machines	.0291	
99.	Unload product	.0200	
103.	Keep stock records	.0154	
72.	Tend machines	.0140	
84.	Open valves	.0034	

Data on the following competency, Adjust conveyors or control valves or spouts to regulate flow of product, was viewed differently by the industries responding. Data in Table 51 suggests that adjusting controls was not as important to the flour mill Machine Operators as it was for those in the bakery and dairy. The researcher's personal knowledge of the milling industry suggests, however, that this competency is important to the milling operation since all products move through a maze of conveyors, pipes, etc, but it might be that the Machine Operator, does not perform this role.

TABLE 51

MACHINERY OPERATOR COMPETENCY NUMBER 86
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
86. Adjust conveyors or control valves, spouts, etc. to regulate flow of product.	BAKERY	1	0	3	3	.0419
	DAIRY	2	0	6	14	
	MILL	1	1	0	1	

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The data in Tables 52, 53, 54, 55, 56 and 57 reveals that the competencies which are "Important" for the Machinery Operator in the bakery and dairy tend to be different from and "Not Important" for the mill Machinery Operator. Since the bakery and dairy operations surveyed tend to be smaller in size, it might be that the Machinery Operator also has additional responsibilities, such as Making machinery adjustments, Repairing machinery, Unloading packaged products, Keeping stock records, Tending machines and Opening valves. Conversely, the three flour mills reporting indicated the above competencies to be of "No Importance". Since the milling operations were very large in comparison to the bakeries and dairy, it could be that the mill Machinery Operator performs few tasks outside of the operation of machinery.

TABLE 52

MACHINERY OPERATOR COMPETENCY NUMBER 82
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
82. Make minor adjustments to machinery.	BAKERY	0	1	3	3	.0352
	DAIRY	1	2	10	9	
	MILL	2	0	1	0	

TABLE 53

MACHINERY OPERATOR COMPETENCY NUMBER 83
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
83. Repair machinery.	BAKERY	2	1	3	1	.0291
	DAIRY	2	7	7	6	
	MILL	3	0	0	0	

TABLE 54

MACHINERY OPERATOR COMPETENCY NUMBER 99
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
99. Unload packaged product.	BAKERY	2	2	2	1	.0200
	DAIRY	1	1	5	15	
	MILL	2	0	0	1	

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TABLE 55

MACHINERY OPERATOR COMPETENCY NUMBER 103
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
103. Keep and compile stock records.	BAKERY	5	0	2	0	.0154
	DAIRY	3	2	7	10	
	MILL	3	0	0	0	

TABLE 56

MACHINERY OPERATOR COMPETENCY NUMBER 72
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
72. Tend machine that performs one or more packaging functions (filling, marking, weighing, wrapping, closing, etc.).	BAKERY	0	1	5	1	.0140
	DAIRY	1	1	11	9	
	MILL	2	0	0	1	

TABLE 57

MACHINERY OPERATOR COMPETENCY NUMBER 84
WITH A SIGNIFICANT PROBABILITY VALUE
(Below .05 Level)

COMPETENCY	INDUSTRY	FREQUENCY				P-VALUE
		1	2	3	4	
84. Open valves.	BAKERY	2	0	4	1	.0034
	DAIRY	1	1	7	13	
	MILL	3	0	0	0	

Shipping Clerk competencies were tested across the meat and bakery industries for similarity. The results appear in Table 58. All thirteen competencies were "Similar" for the job of Shipping Clerk in the meat and bakery industries.

TABLE 58

EVALUATION OF SHIPPING CLERK COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
158.	Bend containers	.9693	
155.	Insert items into containers	.7246	
156.	Nail covers	.6760	VERY SIMILAR
161.	Weigh containers	.6664	
162.	Attach postage	.6664	
151.	Compare quantity against order	.5397	
153.	Assemble containers	.3288	
157.	Operate strapping machine	.3288	
159.	Place identifying information	.1739	
152.	Put up orders	.1121	SIMILAR
160.	Move containers	.0640	
150.	Prepare products	.0530	
154.	Select containers	.0530	

The probability values and a similarity rating for the job title Routeman/Salesman, appear in Table 59. All sixteen competencies appeared "Similar" across industry lines. Similar training programs could be organized to train for this job title in both the dairy and bakery industries.

TABLE 59

EVALUATION OF ROUTEMAN/SALESMAN COMPETENCIES RANK ORDERED BY PROBABILITY VALUES

COMP. NO.	COMPETENCY SYNOPSIS	P-VALUE	EVALUATION
121.	Pick up rejected merchandise	.8191	VERY SIMILAR
113.	Deliver items	.7183	
124.	Balance cash	.7062	
120.	Set up displays	.6531	
116.	Write delivery order	.5670	SIMILAR
118.	Collect for deliveries	.5640	
110.	Have appropriate license	.5570	
117.	Make out invoice	.5298	
115.	Promote new products	.4435	
119.	Stock shelves	.4435	
114.	Solicit new business	.4065	
123.	Keep records of collections	.3988	
122.	Keep records of deliveries	.3397	
125.	Be accountable for merchandise	.3072	
112.	Load truck	.2933	
111.	Drive truck over route	.0734	

CHAPTER III

CONCLUSIONS

1. The research model continued to be satisfactory, yielding the data necessary to satisfy the purpose of the study.
2. Agricultural products industries have breadth and complexity, involving professional, technical and vocational occupations for which employees are required to possess varying degrees of knowledge, skills and attitudes for successful performance.
3. Competencies for job titles in the bakery, meat, dairy and flour milling industries were defined somewhat more broadly than were the competencies contained in previously completed Agricultural Manpower Studies because of the large number of job titles involved and because the researcher lacked familiarity in the area. Based on ratings received, however, it would appear that competencies rated were important to the particular job titles studied.
4. Project interviewers indicated that persons in agricultural products industries were less sincere in responding to competency instruments as compared to employees in agricultural production and mechanics.
5. There was a tendency for persons in job titles below the management level to rate their specific duties higher than broad, general principles about their job. Example: Competency 96, "Inspect filled container to insure packaging according to specifications" was rated by Plant Workers or Machinery Operators and received the highest mean rating, whereas Competency 72, "Tend machine that performs one or more packaging functions" was rated eighteenth in importance and is an overall description of their job. This indicates

that these persons were more aware of specific job duties than an overall picture of their job as it relates to the entire production or processing operation. Conversely, Managers and Supervisors rated general, broad principles relating to the overall production or processing operation as being paramount.

6. Personal Qualities Competencies are competencies needed by all employees in varying degrees across the four industries.
7. The smaller the business, the more competent employees need to be in a greater number of knowledges and skills.
8. There are many competencies which are common across industry lines. Conversely, there are specific competencies required for employment in job titles indigenous to a particular industry and closely identified with the product handled.
9. Competencies identified as being important for entry into the agricultural products industries provide information essential for evaluating programs and for advising students.

Recommendations For Program Implementation and For Further Research

The following recommendations have been made as an outgrowth of the conclusions of this study. Feelings held by researchers apart from the conclusions are also incorporated in the recommendations.

1. Competencies required for successful entry into job titles in agricultural products should be researched further for competency commonalities which may exist within the several job titles. This step could reduce the number of different programs required.
2. As commonalities are isolated and grouped, the curriculum development process should begin. The first step would be to divide each competency into separate tasks performed by workers.
3. Through an analysis of the curriculum, determine the probable length of the educational program necessary for training persons for each job title. Determining the probable length of an educational program would facilitate program planning efforts, since length is often the prime determinant in cost considerations. Program length may vary from short, intensive courses to courses of two to three years in length.
4. Curriculum materials for teachers' use should be prepared and made available to schools offering agricultural products education programs.
5. Plan and develop an education program aimed at agricultural products groups and school administrative personnel at the several educational levels in order to make them aware of the findings of the study.
6. Work cooperatively with interested school administrative personnel at all levels to initiate educational programs to meet employment needs of agricultural products industries. Though the aid of the Agricultural Supervisor

of the Office of the Superintendent of Public Instruction, assist local schools in expanding already existing agricultural education programs toward meeting newly identified needs rather than initiate programs in institutions having no previous experience with vocational agricultural education programs.

7. Organize statewide advisory committees for each agricultural education program to be established for the purposes of offering advice and assistance in (1) locating programs, (2) facilities, (3) equipment, (4) type of instructors, (5) experience programs for students, (6) student recruitment, (7) placement of students and (8) program evaluation.

8. Articulate through the Office of the State Superintendent of Public Instruction, the several levels of agriculture programs being conducted throughout the state, specifically career education programs in agriculture at grade and junior high school, high school and post-high school agricultural education programs, agricultural programs at community colleges and/or four year universities and colleges and programs of adult agricultural education.

9. Distribute lists of competencies available as a result of this study and curriculum materials which might be developed for the various job titles to teachers of vocational agricultural education at the several educational levels throughout Montana. These data will provide a valuable basis for teachers making local curriculum adaptations.

CHAPTER IV

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CHAPTER V

APPENDICES

APPENDIX A

AGRICULTURAL PRODUCTS QUESTIONNAIRE

DEPARTMENT OF AGRICULTURAL AND INDUSTRIAL EDUCATION

Montana State University

Bozeman, Montana

AGRICULTURAL MANPOWER PROJECT

AGRICULTURAL PRODUCTS QUESTIONNAIRE

December 3, 1973

1. Firm Name		Phone
2. Street Address	City	Zip

LIST PRODUCTS MANUFACTURED IN ORDER OF IMPORTANCE

3A.	4D.
3B.	4E.
3C.	4F.

PERSONNEL INFORMATION

5. Total Number of Employees for the Pay Week of December 14th.	Males	Females	Chief Executive and Title

JOB TITLES

6. Job Titles In Your Business *	Number of Persons in This Job Title
Example: meat inspector	3
seed analyst	2

7. Name of Person Completing This Form	7A. Name	7B. Title

Thank you for completing this form. Your cooperation is appreciated.

* Please Use Back For Additional Job Titles

APPENDIX B

COMPETENCY INSTRUMENT FORMAT

Montana Agricultural Manpower Project
Department of Agricultural and Industrial Education
Montana State University, Bozeman, Montana

COMPETENCY RATING SHEET

Please rate each competency statement by telling the interviewer the number that you believe rates the importance of each judgement, knowledge or skill. Each competency should be rated on a scale of 1 to 4, with 1 being NOT IMPORTANT and 4 being ESSENTIAL. Remember, you are being asked to indicate the judgement, knowledge and skills a Cooler Man, etc. needs at the time of job entry.

Cooler Man ...
Dock Man ...
Warehouseman ...
Receiving Clerk ...

Be Able To:	NOT IMPORTANT	OF SOME IMPORTANCE	IMPORTANT	ESSENTIAL
130. Have the strength requirements to lift heavy items.	1	2	3	4
131. Maintain Union membership.	1	2	3	4
Receiving:				
Be Able To:				
132. Receive, store and issue equipment, material supplies, products, etc.	1	2	3	4
133. Convey materials and items from receiving or production areas to storage areas by hand or using machinery.	1	2	3	4
134. Place materials or products on conveyor or truck by hand or hoists, winches, etc.	1	2	3	4

APPENDIX C

RATING SHEET

MONTANA AGRICULTURAL MANPOWER PROJECT PHASE II

AGRICULTURAL PRODUCTS

Montana State University

Answer Sheet for Competency Ratings

Date _____

Interviewer _____

Job Title of Employee Giving Ratings _____

Job Title(s) Being Rated _____

Business _____ Name

- ☐ Bakery
- ☐ Dairy
- ☐ Meat
- ☐ Mill

ID No. _____

INSTRUCTIONS

Enter the competency number on the line and circle the proper number rating the importance of the job task, not the ability to perform the task.

1 - Not Important
2 - Of Some Importance
3 - Important
4 - Essential

Use the sheet continuously as long as the person being interviewed remains the same. Skip two (2) spaces and go on to the next competency series.

Comp. No.	Rating	Comp. No.	Rating	Comp. No.	Rating	Comp. No.	Rating
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4
_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4	_____	1 2 3 4

APPENDIX D

INTERVIEWER INSTRUCTION SHEET

AGRICULTURAL MANPOWER PROJECT

March, 1974

SPECIFIC DIRECTIONS:

1. Interview only full-time employees.

2. Always try to interview the person who actually does the job.

3. Interview as many people as you can in each job title.

4. Two books have been provided -- one for yourself and one for the person being interviewed.

5. INTERVIEW EACH EMPLOYEE FOR PERSONAL QUALITIES.

6. For persons employed in Mills - do Crop Production competencies.

7. Interpret job titles - an employee called a Baker is sometimes a Divider Operator or Mixer, etc. It is important to find out the specific tasks.

8. Be sure to cover all possible overlaps - i.e.: if the Plant Superintendent is the Buttermaker, be sure he completes those competencies as well.

9. A Coolerman in one industry is called a Warehouseman or Dock Man in another or in another plant. Be resourceful in fitting personnel into the job title areas provided.

10. The rating sheets are not carbon sensitive this year. A carbon must be used. It would probably be a good idea to put a cardboard in between so the writing doesn't go through. Keep the copies and send the originals to us in supplied envelopes.

11. Mail in completed rating sheets as they are done. This will facilitate our coding process.

12. Mail in progress cards.

13. Call us collect at 994-2080 (Agricultural Manpower Project Office) or at 994-2132 (Department of Agricultural and Industrial Education) for supplies, problems.

14. Your packet will be mailed to you shortly.

EMPLOYMENT INFORMATION:

1. Pay scale will average $15.00 per business for 1 - 5 persons interviewed and $30.00 for 6 or more persons.

2. Mileage will be at 12¢ per mile.

3. Incidental expenses (stamps, phone calls, etc.) will be reimbursed.

4. Per diem will be paid only in special cases; Mrs. Agocs will approve these special situations.

APPENDIX E

LETTER TO SELECTED RESPONDENTS

Montana State University
College of Agriculture

Directors Office

Agricultural Experiment Station
Bozeman, Montana 59715 *Tel. 406-587-3121*

February 20, 1974

We request your participation in the Agricultural Manpower Project which is being conducted cooperatively by the Montana Experiment Station and the Office of the Superintendent of Public Instruction.

We find it necessary to contact you to identify the knowledge, skills and attitudes needed by those employed in your business. We would greatly appreciate your cooperation in rating those job tasks we have identified.

In a few weeks an interviewer will be contacting you to review the job skills necessary for employment in your business. We hope that the inconvenience and time involved will be tempered by the fact that the information you provide will be used to help plan Agricultural Education programs in Montana. Hopefully, these programs will provide you, in the near future, with trained manpower for jobs in your business.

We express to you our appreciation for your cooperation and the information that you will be providing for us which will benefit our research.

Very truly yours,

J. A. Asleson
Director

JAA:cbm

APPENDIX F

CODING RATIONALE

BAKERY - Cards 01 through 05

CARD 01

Columns 1 through 3	I. D. Number		
Column 4	Industry designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 21	Competencies B1 - B12	Personal Qualities-Bakery	11 comp.
Columns 22 through 24	Job title being rated		
Columns 25 through 70	Competencies B20 - B65	Supervisor - Bakery	45 comp.

CARD 02

Columns 1 through 3	I. D. Number		
Column 4	Industry designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 44	Competencies B70 - B104	Machine Bagger-Bakery	34 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 63	Competencies B110 - B125	Routeman-Bakery	15 comp.

CARD 03

Columns 1 through 3	I. D. Number		
Column 4	Industry designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 28	Competencies B130 - B148	Warehouseman-Bakery	18 comp.
Columns 29 through 31	Job title being rated		
Columns 32 through 44	Competencies B150 - B162	Shipping Clerk-Bakery	12 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 65	Competencies B170 - B187	Mixer-Bakery	17 comp.

CARD 04

Columns 1 through 3	I. D. Number		
Column 4	Industry designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 24	Competencies B190 - B204	Divider Operator-Bakery	14 comp.
Columns 25 through 27	Job title being rated		
Columns 28 through 43	Competencies B211 - B226	Molder-Bakery	15 comp.
Columns 44 through 46	Job title being rated		
Columns 47 through 61	Competencies B230 - B244	Bench Hand-Bakery	14 comp.

CARD 05

Columns 1 through 3	I. D. Number		
Column 4	Industry designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 26	Competencies B270 - B286	Baker-Retail - Bakery	16 comp.
Columns 27 through 29	Job title being rated		
Columns 30 through 44	Competencies B250 - B264	Overman-Bakery	14 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 56	Competencies B290 - B298	Hand Bagger-Bakery	8 comp.

DAIRY - Cards 06 through 10

CARD 06

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 21	Competencies D1 - D12	Personal Qualities-Dairy	11 comp.
Columns 22 through 24	Job title being rated		
Columns 25 through 70	Competencies D20 - D65	Supervisor-Dairy	45 comp.

CARD 07

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 44	Competencies D70 - D104	Machine Operator-Dairy	34 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 63	Competencies D110 - D125	Routeman-Dairy	15 comp.

CARD 08

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 28	Competencies D130 - D148	Cooler Man-Dairy	18 comp.
Columns 29 through 31	Job title being rated		
Columns 32 through 64	Competencies D350 - D382	Buttermaker-Dairy	32 comp.

CARD 09

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 33	Competencies D385 - D408	Cheesemaker - Dairy	23 comp.
Columns 34 through 36	Job title being rated		
Columns 37 through 65	Competencies D410 - D438	Lab Technician - Dairy	28 comp.

CARD 10

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 38	Competencies D440 - D468	Pasteurizer - Dairy	28 comp.
Columns 39 through 41	Job title being rated		
Columns 42 through 70	Competencies D470 - D498	Ice Cream - Dairy	28 comp.

MEAT - Cards 11 through 13

CARD 11

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 21	Competencies M1 - M12	Personal Qualities - Meat	11 comp.
Columns 22 through 24	Job title being rated		
Columns 25 through 70	Competencies M20 - M65	Supervisor - Meat	45 comp.

CARD 12

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 43	Competencies M550 - M583	Butcher - Meat	33 comp.
Columns 44 through 46	Job title being rated		
Columns 47 through 74	Competencies M585 - M612	Meat Cutter - Meat	27 comp.

CARD 13

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 29	Competencies M615 - M634	Sausage Maker - Meat	19 comp.

CARD 13 (Continued)

Columns 30 through 32	Job title being rated		
Columns 33 through 44	Competencies M640 - M651	Render Operator - Meat	11 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 60	Competencies M150 - M162	Shipping Clerk - Meat	12 comp.

MILL - Cards 14 through 17

CARD 14

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 21	Competencies L1 - L12	Personal Qualities - Mill	11 comp.
Columns 22 through 24	Job title being rated		
Columns 25 through 35	Competencies L700 - L710	Crop Production - Mill	10 comp.

CARD 15

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 55	Competencies L20 - L65	Supervisor - Mill	45 comp.
Columns 56 through 58	Job title being rated		
Columns 59 through 77	Competencies L130 - L148	Warehouseman - Mill	18 comp.

CARD 16

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 44	Competencies L70 - L104	Flour Packer - Mill	34 comp.
Columns 45 through 47	Job title being rated		
Columns 48 through 68	Competencies L715 - L735	Chemist - Mill	20 comp.

CARD 17

Columns 1 through 3	I. D. Number		
Column 4	Industry Designate		
Columns 5 and 6	Card Number		
Columns 7 through 9	Job title being rated		
Columns 10 through 33	Competencies L740 - L763	Miller - Mill	23 comp.
Columns 34 through 36	Job title being rated		
Columns 37 through 47	Competencies L765 - L775	Buhr-Miller - Mill	10 comp.
Columns 48 through 50	Job title being rated		
Columns 51 through 75	Competencies L780 - L804	Smutter - Mill	24 comp.

APPENDIX G

CHI SQUARE WORK SHEETS

COMPETENCY NUMBER	VARIABLE	FREQUENCIES

	1	2	3	4
BAKERY				
DAIRY				
MEAT				
MILL				

COMPETENCY NUMBER	VARIABLE	FREQUENCIES

	1	2	3	4
BAKERY				
DAIRY				
MEAT				
MILL				

COMPETENCY NUMBER	VARIABLE	FREQUENCIES

	1	2	3	4
BAKERY				
DAIRY				
MEAT				
MILL				